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Guidance for the Reregistration of Pesticide Products Containing Methyl Bromide as the Active Ingredient

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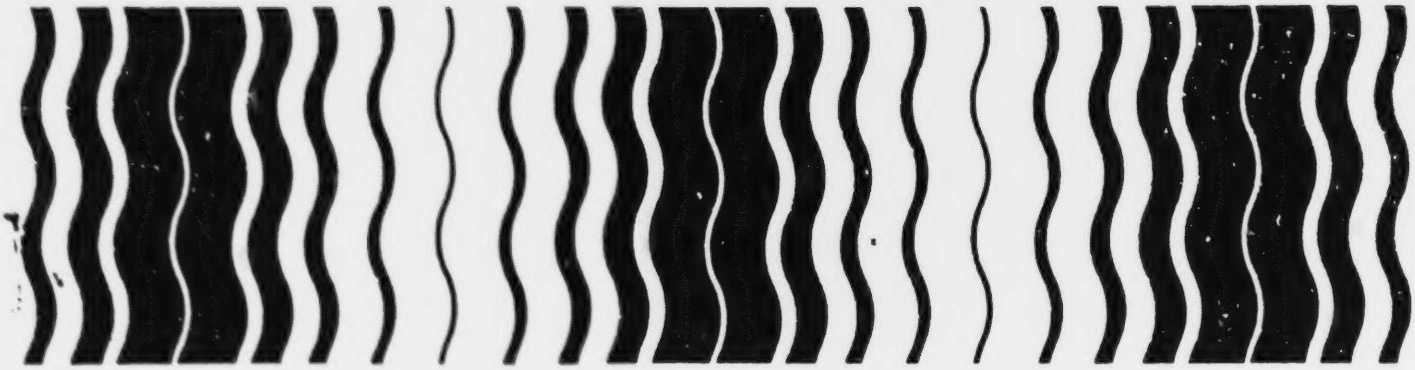
Guidance for the Reregistration of Pesticide Products Containing Methyl Bromide as the Active Ingredient



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GUIDANCE FOR THE REREGISTRATION OF PESTICIDE PRODUCTS

CONTAINING

METHYL BROMIDE

AS THE ACTIVE INGREDIENT

CASE NUMBER 0335

CAS REGISTRY NUMBER 74-83-9

AUGUST 1986

ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF PESTICIDE PROGRAMS

WASHINGTON, D.C. 20460

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I. INTRODUCTION

The Registration Standards Program

EPA has established the Registration Standards program in order to provide an orderly mechanism by which pesticide products containing the same active ingredient can be reviewed and standards set for compliance with FIFRA. The standards are applicable to reregistration and future applications for registration of products containing the same active ingredient. Each registrant of a product containing an active ingredient subject to this Standard who wishes to continue to sell or distribute that product must bring the product and labeling into compliance with FIFRA, as instructed by this Standard. Pesticides have been grouped into use clusters and will be reviewed on the basis of a ranking scheme giving higher priority to (1) pesticides in clusters used on food and feed crops; and (2) pesticides produced in large volumes.

The Registration Standards program involves a thorough review of the scientific data base underlying a pesticide's registration. The purpose of the Agency's review is to reassess the potential hazards arising from the currently registered uses of the pesticide; to determine the need for additional data on health and environmental effects; and to determine whether the pesticide meets the "no unreasonable adverse effects" criteria of FIFRA. In its review EPA identifies:

1. Studies that are acceptable to support the data requirements for the currently registered uses of the pesticide.

2. Additional studies necessary to support continued registration. The additional studies may not have been required when the product was initially registered or may be needed to replace studies that are now considered inadequate.

3. Labeling revisions needed to ensure that the product is not misbranded and that the labeling is adequate to protect man and the environment.

The detailed scientific review, which is not contained in this document, but is available upon request[1], focuses on the pesticide active ingredient. The scientific review primarily discusses the Agency's evaluation of and conclusions from available data in its files pertaining to the pesticide active ingredient. However, during the review of these data the Agency is also looking for potential hazards that may be associated with the end use products that contain the active ingredient. The Agency will apply the provisions of this Registration Standard to end use products if necessary to protect man and the environment.

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[1] The scientific reviews may be purchased from the Information Services Section, Program Management and Support Division (TS-757C), EPA, 401 M St. SW, Washington, DC 20460.

EPA's reassessment results in the development of a regulatory position, contained in this Registration Standard, on the pesticide and each of its registered uses. See Section IV - Regulatory Position and Rationale. Based on its regulatory position, the Agency may prescribe a variety of steps to be taken by registrants to maintain their registrations in compliance with FIFRA. These steps may include:

1. Submission of data in support of product registration;

2. Modification of product labels;

3. Modifications to the manufacturing process of the pesticide to reduce the levels of impurities or contaminants;

4. Restriction of the use of the pesticide to certified applicators or other specially trained individuals;

5. Modification of uses or formulation types; or

6. Specification of packaging limitations.

Failure to comply with these requirements may result in the issuance of a Notice of Intent to Cancel or a Notice of Intent to Suspend (in the case of failure to submit data).

In addition, in cases in which hazards to man or the environment are identified, the Agency may initiate a special review of the pesticide in accordance with 40 CFR Part 154 to examine in depth the risks and benefits of use of the pesticide. If the Agency determines that the risks of the pesticide's use outweigh the benefits of use, the Agency may propose additional regulatory actions, such as cancellation of uses of the pesticide which have been determined to cause unreasonable adverse effects on the environment.

EPA has authority under the Data Call-In (DCI) provisions of FIFRA sec. 3(c)(2)(B) to require that registrants submit data to answer our questions regarding the chemical, toxicological, and environmental characteristics and fate of a pesticide. This Registration Standard lists the data EPA believes are necessary to resolve our concerns about this pesticide. These data are listed in the Tables A, and B in Appendix I. Failure to comply with the DCI requirements enumerated in this Registration Standard may result in issuance by EPA of a Notice of Intent to Suspend the affected product registrations.

Registrants are reminded that FIFRA sec. 6(a)(2) requires them to submit factual information concerning possible unreasonable adverse effects of a pesticide at any time that they become aware of such information. You should notify the Agency of any information, including interim or preliminary results of studies, if those results suggest possible adverse effects on man or the environment. This requirement continues as long as your products are registered by the Agency.

II. CHEMICAL COVERED BY THIS STANDARD

A. Description of Chemical

The following chemical is covered by this Registration Standard.

Common Name: Methyl Bromide.

Chemical Name: Bromomethane.

CAS Registry No: 74-83-9.

EPA/OPP Pesticide Chemical Code: 053201.

Empirical Formula: CH_3Br.

Trade Names: Brom-O-Gas®; Celfume®; Dowfume®; Embafume®; Kayafume®; Meth-O-Gas®; Terr-O-Gas 100®.

Description of Physical Characteristics of Chemical:

Color: Colorless to light yellow.

Physical State: Gas at 25°C.

Odor: Odorless.

Melting Point: -94°C.

Boiling Point: 4°C.

Specific Gravity: 1.732 at 0°C.

Solubility: 1.75 g/100ml H_2O at 20°C and 748 mmHg; readily soluble in lower alcohols, ethers, esters, ketones, halogenated and aromatic hydrocarbons, and CS_2.

Vapor Pressure: 1400 mmHg at 20° C.

Octanol/Water Partition Coeff.: log P = 1.19 (15.5:1).

Stability: Degrades by hydrolysis; 35-day half-life in soil.

Flammability: Nonflammable.

Explodability: Nonexplosive.

Storage Stability: Stable indefinitely upon storage.

Corrosion Characteristics: Non-corrosive to metal containers; traces of water or acid may lead to corrosion of application equipment.

B. Use Profile

Type of Pesticide: Acaricide; Fungicide; Herbicide; Insecticide; Nematicide; Rodenticide.

Pests Controlled: Insects; mites; rodents; plant pathogens; nematodes; termites; weeds.

Registered Uses: Preplant, soil fumigation; stored commodities (both raw agricultural commodities and processed foods/feeds); greenhouses; termite control; grain elevators; mills, ships and transportation vehicles.

Predominant Use(s): Vegetables; tobacco; strawberries; commodity/structural; government quarantine; ornamentals; fruits.

Mode of Activity: Fumigation.

Formulation Types Registered: Gaseous, liquid under pressure, or liquid.

Method of Application: Chisel application to field soil; gravity distribution for smaller bins; forced (recirculation) distribution systems; tarpaulin.

III. AGENCY ASSESSMENT

A. SUMMARY

The Agency reviewed data submitted to support the registration of methyl bromide. Numerous data gaps exist for methyl bromide and few definitive conclusions can be made. Based on the available data, the Agency has reached the following conclusions.

1. Methyl bromide is considered highly acutely toxic. Applicator exposure is a major concern with use of methyl bromide. Currently, all methyl bromide products in containers of 1.5 lbs or greater are restricted use. Applicator exposure during all types of fumigation can be reduced through additional protective measures (use of chloropicrin as a warning agent, restricted use classification of 1.5 lb containers or less, interim reentry levels, extensive label revisions and distribution of an application manual with methyl bromide products providing the necessary details for safe use of the product).

2. There are concerns regarding methyl bromide's reproductive and oncogenic potential due to its structural similarity to animal reproductive toxins and oncogens, and its demonstrated mutagenic effects. A rat oncogenicity study via inhalation was recently completed in the Netherlands. The Agency has not yet received this study for review, but preliminary findings are reported to be negative. A mouse oncogenicity study via inhalation is in progress at the National Toxicology Program. Chronic toxicity data are required and further evaluation will be conducted.

3. All tolerances for methyl bromide are currently expressed in terms of inorganic bromide. However, residues of methyl bromide per se, that is actual residues of methyl bromide itself, have been detected in a variety of foods. Metabolism, residue and toxicology data are required, and a tolerance reassessment will be conducted after these data are received.

4. While methyl bromide is believed to be highly toxic to birds, fish and aquatic invertebrates, little hazard to nontarget organisms is expected for all indoor and most outdoor uses of methyl bromide. The practice of covering a treated area with a tarpaulin following soil injection minimizes exposure to nontarget organisms following outdoor uses. Methyl bromide's potential to leach to ground water is unknown. Environmental fate and ecological effects data are required and further evaluation will be conducted.

The missing data necessary to evaluate the environmental and human risks associated with the use of methyl bromide must be developed in order to maintain registrations of products or register new products containing methyl bromide.

B. PRELIMINARY RISK ASSESSMENT

Numerous data gaps exist for methyl bromide. The following assessment is based on the available data and will be revised after these data gaps are filled.

Methyl bromide is considered highly acutely toxic. Applicator exposure is a major concern with use of methyl bromide. For most products, use is already restricted to certified applicators or those under the direct supervision of a certified applicator. Based on data from the California Department of Food and Agriculture, between 1981 - 1985 methyl bromide ranked seventh as a cause of systemic pesticide poisonings, second as the cause of hospitalization for occupational pesticide poisonings and first in terms of total days hospitalized. Ten deaths were due to methyl bromide in California from 1982 - 1985. All of these deaths were the result of unauthorized persons reentering tarped structures that were being fumigated, and were properly posted with warning signs. A review of the occupational illnesses and injuries from California shows the circumstances leading to the overexposures can be attributed primarily to inadequate employee training or supervision, carelessness, or equipment failure.

The current Occupational Safety and Health Administration (OSHA) standard for methyl bromide is a maximum of 20 ppm (80 mg/M^3). A threshold limit value of 5 ppm (20 mg/M^3) on a time weighted average, and a short-term exposure limit of 15 ppm (60 mg/M^3) are recommended for methyl bromide by the American Council of Government and Industrial Hygienists (ACGIH).

The Agency requires through current labeling that after fumigation of enclosed spaces with methyl bromide, the treated area must be aerated until the level of methyl bromide is below 5 ppm. This is a practical and attainable level which can be achieved through current fumigation practices. This interim level was established under the Label Improvement Program for Fumigants, PR Notice 85-6, August 30, 1985. Entry into the treated area is not allowed until the methyl bromide level is measured, and determined to be below 5 ppm, unless respiratory protection is worn (self-contained-breathing apparatus (SCBA) or combination air-supplied/SCBA). The Agency believes the measures required in PR Notice 85-6 will reduce the risk to workers during fumigation in enclosed spaces. The Agency will reevaluate the 5 ppm level based on the toxicological data required in Table A, and an inhalation study already submitted and under review. Also, the Agency is requiring the addition of chloropicrin as a warning agent during fumigation in enclosed spaces (except for commodity fumigation), restricted use classification of all methyl bromide products, and distribution of an application manual.

The California Department of Food and Agriculture submitted soil fumigation applicator exposure studies. These studies measured the concentration of methyl bromide in the breathing zone under normal use conditions and found the concentrations generally do not exceed 5 ppm on a time weighted average. In the event of a spill or leak, however, the concentrations can exceed 5 ppm. Therefore, the Agency is not requiring respiratory equipment to be worn during routine soil fumigation use, but will require that approved respiratory equipment be available and be used in case of a spill or leak. The Agency believes additional protective measures should be taken to reduce worker risks during soil fumigation. These measures include adding chloropicrin as a warning agent, restricted use classification of 1.5 lb containers or less that are currently unclassified, and extensive revisions and improvements in precautionary statements and use directions on the labeling of all methyl bromide products covering safe use of the product. See Section IV Regulatory Position and Rationale for a detailed discussion of these measures.

C. SCIENCE FINDINGS

Most of the toxicological information on methyl bromide is from published sources. These sources were analyzed in the Chemical Hazard Information Profile (CHIP) dated September 28, 1984 and revised February 20, 1985, by the US EPA, Office of Toxic Substances.

1. Acute Toxicity. Methyl bromide is considered highly acutely toxic. The approximate LD_{50} in rats is 214 mg/kg by the oral route and 2700 ppm for a 30 minute exposure by the inhalation route. In humans, 1,583 ppm (6.2 mg/L) was lethal to adults exposed for 10 to 20 hours while 7,890 ppm (30.9 mg/L) was lethal after 1 1/2 hours. The lungs and kidneys are affected by methyl bromide. No acute testing is required.

2. Subchronic Toxicity. Irish et al. (1940) reported methyl bromide was toxic to rats, guinea pigs, and rabbits exposed by the inhalation route for up to six months at 0.85 mg/L, and 0.42 mg/L was toxic to monkeys. The doses of 0.13 mg/L for rats, guinea pigs and monkeys and 0.65 mg/L for rabbits showed no toxic signs. Rats exposed to 65 ppm methyl bromide for 100 hours or 55 ppm for 1080 hours showed no neurotoxic effects. Rabbits exposed to 65 ppm for 100 hours showed weight loss and neurological alterations. A 13-week rat study in which methyl bromide was dissolved in peanut oil and fed by gavage five times a week showed possible squamous cell carcinomas of the forestomach at 50 mg/kg/day (Danse, et al., 1984). The above studies are inadequate for regulatory purposes. Subchronic inhalation studies in the rodent and rabbit are required.

3. Chronic Feeding and Oncogenicity. There are no adequate data by any route to characterize the effects of long-term exposure to methyl bromide. Concerns regarding oncogenic effects arise due to its structural similarity to ethylene dibromide (EDB) and dibromochloropropane (DBCP), both animal oncogens, and because of its demonstrated mutagenic effects. A mouse oncogenicity study via inhalation is in progress at the National Toxicology Program. A rat oncogenicity study via inhalation has recently been completed in the Netherlands. Although the Agency has not yet received this study for review, preliminary findings are reported to be negative. Oncogenicity and chronic feeding studies by gavage in a rodent and non-rodent are required because tolerances are needed.

4. Teratogenicity. Both rats and rabbits were exposed to either 20 or 70 ppm of methyl bromide in the air. The high dose caused adverse maternal effects especially in rabbits (only one of 25 rabbits was alive at day 30). The low dose caused no adverse effects in the dams or pups. The rat segment of the study is adequate for regulatory purposes because a large number of animals were dosed during the critical period of gestation, and survival at the high dose was not as impaired as it was in the rabbit. However, the rabbit segment of the study is not adequate because only one rabbit survived the highest dose tested. A teratology study in rabbits is required.

5. Reproduction. Concerns regarding reproductive effects arise due to the structural similarity of methyl bromide to animal reproductive toxins such as EDB and DBCP. A reproduction study via inhalation has been submitted to the Agency and is currently under review. Preliminary review of the study indicates no adverse reproductive effects were detected. Because there is dietary exposure, a reproduction study by gavage is required.

6. Mutagenicity. Methyl bromide is mutagenic in bacterial tests using S. typhimurium, E. coli, and K. pneumoniae. Methyl bromide is a direct-acting mutagen and induces primarily base-pair substitution mutations. Methyl bromide has been shown to induce gene mutations in Drosophila and at two different loci in mammalian cells in culture. Methyl bromide does not appear to be as potent a mutagen as ethylene dibromide in that more chemical is needed to induce a response. Both bone marrow and sister chromatid exchange tests are required. Other genotoxic effects testing are required including an unscheduled DNA synthesis test using rat hepatocytes and a test to determine the effects on germ cells.

7. General Metabolism. Published sources indicate methyl bromide is rapidly absorbed via the lungs. Additional testing is not needed at this time, but may be requested depending on the evaluation of dietary, chronic toxicology and worker exposure data.

8. Ecological Effects. No toxicity data are available on non-target organisms. Due to the highly toxic nature of methyl bromide to humans, it is expected to be toxic to birds, fish, and wildlife. However, little hazard to nontarget organisms is expected for all indoor and most outdoor uses of methyl bromide. The practice of covering a treated area with a tarpaulin following soil injection minimizes exposure to nontarget organisms following outdoor uses. Because surface waters may receive input from ground water, the need for acute testing on freshwater fish and aquatic invertebrates will depend on the determination of methyl bromide's potential to reach ground water. Preliminary ground water monitoring data showed no detectable levels (the level of detection was 1 ppb). No oral or dietary testing on birds is required because methyl bromide is a gaseous formulation.

9. Environmental Fate. Methyl bromide is not expected to reach surface water because most outdoor uses are soil injected. Methyl bromide's potential to reach ground water is unknown, but based on its chemical structure, solubility and use patterns, it has been identified as having the potential to enter ground water. The Agency issued a data call-in notice on March 8, 1984 requesting product chemistry data and a data call-in notice on May 16, 1984 requesting environmental fate data. Hydrolysis data indicate methyl bromide breaks down at a rate of 1.4 mg /liter water/day at 25°C to principally methanol and inorganic bromide. Soil metabolism, leaching and adsorption/desorption and soil dissipation data have been received by the Agency and are currently under review. A photodegradation study in water is required. Based on these data, the Agency will evaluate methyl bromide's potential for contaminating ground water. Because the Agency is unable to determine if residues exist in primary treated crops, rotational crop data are reserved. If residues of concern are found in the primary treated crops, rotational crop data will be required.

D. TOLERANCE REASSESSMENT

Tolerances have been established (40 CFR 180.123) for residues of inorganic bromide in raw agricultural commodities which have been fumigated postharvest with methyl bromide.

Tolerances have been established (40 CFR 180.199) for residues of inorganic bromides resulting from soil treatment with combinations of chloropicrin and methyl bromide.

According to 40 CFR 180.3 (c)(1) "Where tolerances for inorganic bromide in or on the same raw agricultural commodity are set in two or more sections in this part, the overall quantity of inorganic bromide to be tolerated from use of two or more pesticide chemicals for which tolerances are established is the highest of the separate applicable tolerances."

According to 40 CFR 180.3(c)(2) tolerances are established in terms of inorganic bromide residues "based on evidence of the dissipation of the organic pesticide or its conversion to inorganic bromide residues in the food when ready to eat," and therefore, methyl bromide per se is exempt from a requirement for tolerance.

Tolerances have been established for residues of inorganic bromide in milled fractions resulting from fumigation of grain-mill machinery (21 CFR 193.225), and for residues of inorganic bromide in processed grains used in fermented malt beverages (21 CFR 193.230). Food additive tolerances have been established for residues of inorganic bromide in fumigated processed foods (21 CFR 193.250). Feed additive tolerances have been established for residues of inorganic bromide in fumigated animal feeds (21 CFR 561.260).

The Agency evaluated the residue and toxicology data supporting these tolerances, and reviewed all uses of methyl bromide. Based on the available data, the following conclusions have been made.

- Because residues of methyl bromide per se have been found in foods, the establishment of tolerances in terms of inorganic bromide residues alone is not adequate. Data concerning the residues of methyl bromide per se have been or are required.
- The metabolism of methyl bromide in plants is not adequately understood, and plant metabolism studies are required.
- None of the inorganic bromide tolerances in or on raw agricultural commodities (RACs) or processed products is supported due to the inadequacy of available data. Data are required for each registered RAC and processed product depicting the residues of concern resulting from application. If both preplant and stored commodity fumigations are registered uses on a given commodity, then data are required depicting both inorganic bromide and methyl bromide per se residues resulting from the combination of the two types of treatment, and one tolerance will be established.

- The metabolism of methyl bromide in animals is not adequately understood. However, no animal metabolism studies will be required unless the plant metabolism or residue studies indicate the presence of residues of concern in feed items.

- No conclusions can be reached at this time as to the magnitude of residues of methyl bromide in animal products because the magnitude of residues in feed items, metabolism in plants and (if required) metabolism in animals are not adequately defined. Upon receipt of these data, the necessity of tolerances in animal products will be determined.

- Plant metabolism data must be developed first to identify the residues of concern. Residue data will then be required showing the magnitude of the residues of concern in or on treated foods or feeds. If plant metabolism or residue studies indicate the presence of residues of concern in feed items, animal metabolism and livestock feeding studies will be required.

An Acceptable Daily Intake (ADI) for inorganic bromide set by FAO/WHO is 1.0 mg/kg/day. A similar ADI (1.1 mg/kg/day) set by FDA in 1961 is used by the Agency. The ADI set by FDA is based on information derived from human use of inorganic bromide therapeautic drugs showing that 11 mg/kg/day inorganic bromide is a safe level provided that the person is not unduely sensitive to inorganic bromide. A 10-fold safety factor is used to allow for human sensitivity. Based on the available reviews of laboratory animal data and human use as a therapeutic drug, no further data are requested on inorganic bromide. The Theoretical Maximum Residue Concentration (TMRC) for inorganic bromide resulting from treatment with methyl bromide is 0.42 mg/kg/day. This utilizes approximately 38% of the ADI of inorganic bromide.

Because no chronic and reproduction studies are available, an ADI has not been set for methyl bromide per se. When toxicological data are received, an ADI will be established. Based on requested residue and toxicology data a tolerance reassessment will be performed.

IV. REGULATORY POSITION AND RATIONALE

A. REGULATORY POSITIONS

Based on review and evaluation of all available data on methyl bromide, the Agency has made the following determinations. Refer to Section IV.D for specific language for label revisions.

1. The Agency considered whether methyl bromide met one of the criteria for Special Review, that of acute toxicity to humans, and determined it will not be placed in the Special Review process at this time. The Agency is requiring extensive additional protective measures to reduce worker risks. The Agency will evaluate the effectiveness of these measures by examining pesticide poisoning incidence reports to determine if additional regulatory action is necessary to reduce the risk from methyl bromide exposure.

Rationale: The Agency is very concerned about the high acute toxicity of methyl bromide, and the serious poisoning incidents that have been reported. However, a review of the occupational poisoning data from the State of California indicates circumstances leading to overexposures can be attributed primarily to inadequate employee training or supervision, carelessness, or equipment failure. The Agency believes additional protective measures can be taken to reduce worker risks during all types of fumigation. These measures include adding chloropicrin as a warning agent, restricted use classification of 1.5 lb containers or less that are currently unclassified, extensive label revisions, and the inclusion of an application manual for all methyl bromide products covering the safe use of the product (these measures are discussed in detail in Regulatory Position and Rationale 2, 3 and 4, and B. Criteria for Registration). The Agency believes the measures required in PR Notice 85-6 will also reduce worker risks during fumigation of enclosed spaces. The Agency believes these measures will substantially reduce acute risks to users and that a Special Review is not necessary at this time. The Agency will monitor incident data to determine if exposure is being significantly reduced.

2. The Agency is requiring that chloropicrin at a concentration between 0.25% and 2.0% be present as a warning agent in methyl bromide formulations used for all outdoor sites including soil fumigation and for fumigation in enclosed spaces, except for commodity fumigation. The Agency is requiring that chloropicrin at these levels be listed as an inert ingredient, and that the label state it has been added as a warning agent.

Rationale: Many methyl bromide products contain chloropicrin as a warning agent because methyl bromide is odorless and a worker may be unaware of being exposed to hazardous levels. However, there are existing registrations for 100% formulated methyl bromide products. The use of chloropicrin with its ability to cause painful irritation to the eyes, producing tearing, and its disagreeable pungent odor at low concentrations will warn a person of methyl bromide exposure and will promote its safe use. The Agency is not requiring that chloropicrin be added to commodity fumigation uses because there is a possibility that residues of chloropicrin remain in treated products, and no tolerances for chloropicrin have been established.

Registrants whose products require the addition of chloropicrin must submit applications for amended registrations. At the level of 2% or less, chloropicrin adds no additional efficacy to the formulation and, therefore may be classified as an inert ingredient (currently, some products list chloropicrin at a level of 2% or less as an active ingredient).

3. The Agency will require all products containing methyl bromide to be classified for restricted use. The Agency will propose to amend 40 CFR 162.31 (proposed §152.171, 49 FR 37946-37949) to require restricted use classification for 1.5 lb containers or less of methyl bromide containing chloropicrin as a warning agent. Methyl bromide products that are restricted according to 40 CFR 162.31 will continue to be classified for restricted use.

Rationale: In 40 CFR 162.31, the Agency restricted all methyl bromide formulations in containers greater than 1.5 lbs and containers with not more than 1.5 lbs having no indicator. Containers of 1.5 lbs or less with 0.25% to 2.0% chloropicrin as a warning agent that are used for nondomestic single applications for soil treatment in closed systems are unclassified according to 40 CFR 162.31. The Agency believes restricted use classification of all methyl bromide products is necessary to protect users from the acute toxic effects of methyl bromide. The registrations of the currently unclassified methyl bromide products must be amended to require restricted use classification and the Agency will amend its regulation accordingly.

4. The Agency will require that application manuals be developed by registrants to provide the necessary details for the safe use of methyl bromide fumigants. Such manuals will be considered part of the registered labeling and will be required to be submitted within 90 days from the date of receipt of this standard for approval by the Agency.

Rationale: Because of the limitations of space on labels and the complexity of the precautions necessary to use methyl bromide safely, an application manual is needed to provide an adequate description of the various use patterns and the special precautions applicable to each. The manual should provide, but need not be limited to, information on the chemical and physical properties of the formulation, and should include instructions for the care and use of respiratory equipment, equipment maintenance, pre-fumigation inspections and/or testing, detector device usage, posting, aeration techniques, and instructions to comply with all local regulations and ordinances on fumigants.

5. The Agency will continue to require that enclosed spaces fumigated with methyl bromide be aerated until the level of methyl bromide is below 5 ppm. Entry by any person into the treated areas before this level is reached is not allowed unless the person is provided with an approved respiratory protection device (SCBA or combination air-supplied/SCBA).

Rationale: The interim 5 ppm reentry level was established under the Label Improvement Program for Fumigants, PR Notice 85-6, August 30, 1985 because the Agency is concerned about the possible inhalation exposure of workers handling methyl bromide because of its high acute toxicity. To better evaluate the worker risk, the Agency issued a Special Data Call-In Notice under FIFRA §3(c)(2)(B) requesting applicator exposure data. This notice originally requested data for dermal and inhalation exposure. The Agency waived the requirement for dermal exposure data because methyl bromide fumigation is done in a closed system, and inhalation is the most important route of exposure even during a spill. The inhalation exposure data were received by the Agency in July 1986 and are currently under review. As soon as these data and the toxicology data required in Table A are submitted and reviewed, the Agency will reevaluate the reentry level.

6. The Agency will not require respiratory equipment to be worn during routine soil fumigation, but will require that such equipment be on the premises in case of an emergency situation.

Rationale: Based on all available data, the Agency has determined that under normal conditions of use the concentration in the working area will not generally exceed 5 ppm as a time weighted average and no respiratory protection is required. However, there is the possibility of a spill or leak during soil fumigation. Therefore, a SCBA or a combination air-supplied/SCBA respirator must be available and will be required for entry into an affected area in the event of a leak or spill.

7. The Agency will not impose a special label advisory statement for endangered species at this time.

Rationale: The Agency does not expect exposure to endangered species. If data indicate methyl bromide may reach surface water, acute aquatic toxicity studies will be required. If the estimated environmental concentrations of methyl bromide exceed the endangered species trigger for aquatic species (1/10 of the LC_{50}), an Office of Endangered Species opinion will be requested.

8. The Agency will not allow any significant new food uses (an increase in the Theoretical Maximum Residue Contribution of greater than one percent) to be established for methyl bromide until the toxicological and residue chemistry data deficiencies identified in Table A have been satisfied.

Rationale: The Agency is unable to complete a tolerance reassessment of methyl bromide because of extensive residue chemistry and toxicology data gaps. The data requested in Table A are needed for the Agency to calculate an ADI for methyl bromide and its metabolites and to reassess the current tolerances.

9. The Agency is requiring residue data to support the existing tolerances for use in or on cumin seed, mangoes, papayas and pomegranates for which no registered uses can be located. If no data developer can be located, the tolerances may be revoked.

Rationale: Tolerances have been established for these crops in terms of inorganic bromide. However, residue data do not exist to support these uses. Also, the Agency is unable to locate registered uses for these crops. The Agency is aware that these tolerances are for imported products, however, data must be submitted to support the tolerances.

10. The Agency is requiring the submission of residue chemistry data to support all current inorganic bromide tolerances relating to the use of methyl bromide (see 40 CFR 180.123, 180.199 and 180.3(c)(1) as well as 21 CFR 193.225, 193.230, 193.250 and 561.260) and to establish tolerances for methyl bromide *per se*. Plant metabolism data along with storage stability data should be developed first followed by the residue data on crops. Animal metabolism data and livestock feeding studies are reserved pending results of the above data. Finally, if residues of concern, including at a minimum inorganic bromide and methyl bromide *per se*, are found in animals as a result of ingesting methyl bromide treated feeds, tolerances will be required for animal products and byproducts, eggs, and milk.

Rationale: None of the methyl bromide tolerances are supported due to the inadequacy of the available data (see Section III. D Tolerance Reassessment). Plant metabolism data must be developed first to identify the residues of concern. Residue data will then be required showing the magnitude of the residues of concern in or on treated foods or feeds. If plant metabolism or residue studies indicate the presence of residues of concern in feed items, animal metabolism and livestock feeding studies will be required.

11. No crop group tolerances, as specified under 40 CFR 180.34(f), may be established at this time.

Rationale: As noted in position 10, none of the current methyl been established for methyl bromide *per se*. Therefore, no group tolerances can be set. The registrants may propose crop group tolerances. When appropriate data required in Table A are submitted and evaluated, crop group tolerances may be set.

12. The Agency will propose that 40 CFR 180.3(c)(2) be deleted, and will propose tolerances for methyl bromide *per se*.

Rationale: Tolerances for brominated organic fumigants such as methyl bromide concurrent with inorganic bromide tolerances were thought unnecessary since the parent compound was expected to degrade completely and/or dissipate by the time the food item was consumed. However, due to findings of methyl bromide *per se* in foods treated post-harvest, the Agency will require tolerances for methyl bromide *per se*.

13. As soon as the required inorganic bromide residue data have been submitted and evaluated, the Agency will consider deleting all existing paragraphs in the 21 and 40 CFR concerning inorganic bromide tolerances and replacing them with a single paragraph for raw agricultural commodities (RACs) (40 CFR 180) and processed products (21 CFR 193 and 561). One inorganic bromide level for each RAC or processed food or feed would be substituted. Pesticides/sources which are covered by the tolerances would be identified. Any tolerance for inorganic bromide must be high enough to cover naturally occurring inorganic bromide plus inorganic bromide resulting from soil and/or postharvest fumigation.

Rationale: Inorganic bromide is a naturally occurring substance and is also a metabolite of numerous pesticides. The Agency policy has been to set inorganic bromide tolerances whenever significant levels of inorganic bromide could result from the use of a pesticide. This policy has resulted in a proliferation of tolerances for inorganic bromide. As described in 40 CFR 180.3(c)(1), whenever more than one inorganic bromide tolerance exists for a single commodity, then the enforcement limit is the highest tolerance for that commodity. Thus the only regulatory limit used for enforcement of inorganic bromide residues on a given commodity is the highest existing tolerance. The proposed deletion of all but the highest inorganic bromide tolerance for a commodity will merely clarify what actually occurs in practice, i.e., the highest tolerance for a commodity is the regulatory limit. The only effect of this change from a regulatory standpoint is to replace multiple CFR sections on inorganic bromide tolerances with one section. It would not affect enforcement procedures or residue chemistry data requirements.

If a new pesticide use results in residues of inorganic bromide, then under the current system a new inorganic bromide tolerance has to be established in yet another section in 40 CFR 180. Under the proposed scheme the only change in the CFR would be that the name of the chemical is added to the section in 40 CFR 180 for inorganic bromide residues. Only if the new use results in higher residues of inorganic bromide than any registered use would the numeric tolerance for inorganic bromide be changed.

Tolerances for the parent compound would need to be set in most cases. The 40 CFR 180 section containing the tolerances for the parent compound should contain a reference to the existence of the tolerances for the inorganic bromide metabolite.

14. While data gaps are being filled, currently registered manufacturing use products (MPs) and end-use products (EPs) containing methyl bromide may be sold, distributed, formulated and used, subject to the terms and conditions specified in this Standard. Registrants must provide or agree to develop additional data, as specified in the Data Appendices, in order to maintain existing registrations.

Rationale: Under FIFRA, the Agency does not normally cancel or withhold registration for previously registered use patterns simply because data are missing or are inadequate (see FIFRA sec. 3(c)(2)(B) and 3(C)(7). Issuance of this Standard provides a mechanism for identifying data needs which then will be required to be submitted to maintain the registration of pesticide products containing methyl bromide. These data will be reviewed and evaluated, after which the Agency will determine if additional regulatory changes are necessary.

B. Criteria for Registration

To be registered or reregistered under this Standard, products must contain methyl bromide as the sole active ingredient*, bear required labeling, and conform to the product composition, acute toxicity limits, and use pattern requirements listed in this section.

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*/ The Agency has determined that chloropicrin in amounts of 2% or less is present solely as a warning agent and must be declared as inert in formulations of 98% to 99.75% methyl bromide. See Section IV(A)(2).

C. Acceptable Ranges and Limits

1. Product Composition Standard

To be registered or reregistered under this Standard, manufacturing-use products (MPs) must contain methyl bromide as the sole active ingredient. Each MP formulation proposed for registration must be fully described with an appropriate certification of limits, stating maximum and minimum amounts of the active ingredient and inert ingredients which are present in products, as well as impurities found at greater than 0.1%.

2. Acute Toxicity Limits

The Agency will consider registration of technical grade and manufacturing-use products containing methyl bromide provided that the product labeling bears appropriate precautionary statements for the acute toxicity category in which each product is placed.

3. Use Patterns

To be registered under this Standard, manufacturing-use products may be labeled for formulation into end-use products only for the use patterns listed below. The EPA Index to Pesticide Chemicals lists all registered uses, as well as approved maximum application rates and frequencies.

- Terrestrial, domestic, food uses on:

  asparagus; broccoli; cauliflower; citrus fruits; deciduous fruit trees (including apple; apricot; cherry and peach); eggplant; grapes; lettuce; melons; nut crops; nut trees; onions (direct seeded); peppers; pineapple; strawberry; tomato

- Terrestrial, domestic, non-food uses on:

  bulk soil (potting soil, top soil); compost piles; forest tree transplants; manure; mulch (hay, manure, straw); ornamental lawns; ornamental plants (including nursery stock); ornamental turf; recreational areas (including athletic fields; golf courses and parks); seed and transplant beds (nonfood); tobacco

- Domestic outdoor use on:

  domestic dwellings (outdoor); wooden plant stakes

- Greenhouse, food uses on:

  tomato
- Greenhouse, non-food uses on:

  nonfood/nonfeed crops

- Indoor

  - Fumigation of stored agricultural commodities use on:

  alfalfa (hay); almond; apple; apricot; artichoke (Jerusalem); barley; beans; beets (roots); Brazil nut; butternut; cabbage; cantaloupe; carrots; cashew; cherry; chestnut; citron; cocoa beans; corn; corn (sweet); cotton (including baled cotton); cottonseed; cucumber; eggplant; filbert (hazelnut); garlic; grapefruit; grapes; honeydew melon; horseradish (roots); kumquat; lemon; lime; macadamia nut (bushnut); muskmelon; nectarine; oats; okra; onion; onion (cipollini bulbs); orange; parsnip (roots); peach; peanuts; pear; peas; pecan; peppers; pimento; pineapple; pistachio; plum; popcorn; potato; prune; pumpkin; quince; radish; rice; rutabaga; rye; salsify (roots); sorghum; squash (summer); squash (winter) squash (zucchini); sugar beets; sweet potato; tangelo; tangerine; tobacco; tomato; turnip (roots); walnut; watermelon; wheat; yams

- Indoor

  - Fumigation of processed food/feed use on:

  candy (processed); cereals (processed); cheese; cheese byproducts; copra; dog feed; eggs (dried); flour (including bagged cereal flour; bakery mixes and cereal flour); feed/food containers (empty) (including bags, boxes and crates); food processing, handling and storage areas; fruits (dried) (including apple; apricot; cherry; date; fig; peach; pear; prune and raisin); grain bins (empty); grain products (processed); herbs; seasoning or spices (dried); meat processing plants (including ham houses); meat products (including cured meat products)

- Indoor

  - Non-food use on:

    Airtight chambers (empty) (including atmospheric chambers, vacuum chambers, and fumigation vaults); barns; boxcars/railway cars (empty); burlap bags (empty); domestic dwellings (including garages); domestic dwelling contents (including furniture); farm storage areas; greenhouse (empty); lumber and wood products; mushroom houses (empty); nonfeed/nonfood containers (empty) (including bags, boxes and crates); paper (stored); poultry houses (empty); ships (cargo)/steel barges; tarpaulins; trailers (empty); van containers (empty)

D. Required Labeling

All manufacturing-use products and end-use products must bear appropriate labeling as specified in 40 CFR 162.10. Appendix II contains information on label requirements. Submit labels and product manuals within 90 days from the date of receipt of this standard for review and approval.

No pesticide product containing methyl bromide may be released for shipment by the registrant after nine months from the date of receipt of this standard unless the product bears an amended label, including the product manual, which complies with the requirements of this standard.

No pesticide product containing methyl bromide may be distributed, sold, offered for sale, held for sale, shipped, delivered for shipment, or received and (having so received) delivered or offered to be delivered by any person in channels of trade after 12 months from the date of receipt of this standard unless the product bears an amended label, including the product manual, which complies with the requirements of this Standard.

In addition to the above, the following information must appear on the labeling:

1. Ingredient Statement

The ingredient statement for Manufacturing-Use Products must list the active ingredient as:

Methyl Bromide

2. Use Pattern Statements

All manufacturing-use products must state that they are intended for formulation into end-use products for acceptable use patterns. Labeling for manufacturing-use products must specify sites which may appear on the labels of end-use products formulated from them and which are listed in Use Patterns, Section C.3. No use may be included on the label where the registrant fails to agree to comply with the data requirements in Table A for that use pattern.

3. Precautionary Statements for Manufacturing-Use Products

a. Labels for manfacturing-use methyl bromide products must bear statements reflecting that methyl bromide is highly acutely toxic. Required precautionary statements associated with this category are specified in 40 CFR 162.10.

b. The signal word "DANGER" along with the word "POISON" in red and the skull and crossbones symbol are required on the front panel of all manufacturing-use labels.

c. The following revised environmental hazard statements must appear on all manufacturing-use labels:

> This pesticide is toxic to wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

4. Precautionary Statements for End-Use Products

a. All end-use products must bear the restricted-use statement:

> RESTRICTED USE PESTICIDE
> DUE TO ACUTE TOXICITY
>
> For retail sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the certified applicator's certification.

b. The following Spanish warning statement must be located on the front panel of all end-use products:

> PRECAUTION AL USUARIO: Si usted no lee Ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

c. The English and Spanish signal words "DANGER" and "PELIGRO" along with the word "POISON" in red and the skull and crossbones symbol are required on the front panels of all end-use products.

d. The following human hazard precautionary statements must appear on the front or side panel under the heading "Hazards to Humans" and in the application manual of all end-use products:

DANGER

> Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury. Liquid or vapor can cause serious skin or eye injury which may have a delayed onset. Do not get liquid on skin, in eyes or on clothing.
>
> [If the product is 100% methyl bromide].
>
> Methyl bromide vapor is odorless and non-irritating to skin and eyes during exposure. Exposure to toxic levels may occur without warning or detection by the user.
>
> [If the product contains chloropricrin as a warning indicator (at levels of 2% or less)].
>
> This product contains chloropicrin as a warning odorant. Chloropicrin may be irritating to the upper respiratory tract, and even at low levels can cause painful irritation to the eyes, producing tearing. If these symptoms occur, leave the fumigation area immediately.

e. The following practical treatment statements must appear on the front panel and in the application manual of all end-use products:

> In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.
>
> If inhaled: Get exposed persons to fresh air. Keep warm. Make sure person can breathe freely. If breathing has stopped, apply artificial respiration. Do not give anything by mouth to an unconscious person.

If on skin: Immediately remove contaminated clothing, shoes, and any other item on skin. Wash contaminated skin area thoroughly with soap and water.

If in eyes: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes.

f. The following "Note to Physician" must be located with the human hazard statements, but in a separate paragraph, on the label, and in the application manual of all end-use products:

> Early symptoms of overexposure are dizziness, headache, nausea and vomiting, weakness and collapse. Lung edema may develop in 2 to 48 hours after exposure, accompanied by cardiac irregularities; these effects are the usual cause of death. Repeated overexposures can result in blurred vision, staggering gait and mental imbalance, with probable recovery after a period of no exposure. Blood bromide levels suggest the occurrence, but not the degree, of exposure. Treatment is symptomatic.

g. The following specific use directions must appear on the label for all end-use products:

> This fumigant is a highly hazardous material and should be used only by individuals trained in its proper use. Before using, read and follow all label precautions and directions, including the attached product manual.
>
> All persons working with this fumigant must be knowledgeable about the hazards, and trained in the use of required respirator equipment and detector devices, emergency procedures, and proper use of the fumigant.
>
> [specific directions for use follow]

h. The following protective clothing statements must appear on the label for all end-use products:

> Wear loose cotton long sleeve shirts and pants, shoes and socks that are cleaned after each wearing. Do not wear jewelry, gloves or boots when handling. Methyl bromide is heavier than air and may be trapped inside clothing and cause skin injury. If full-face respiratory protection is not required, wear goggles or full face shield for eye protection when

handling liquid. After application, immediately remove clothing, shoes and socks. Do not reuse contaminated clothing or shoes until cleaned. Drenched clothing cannot be adequately decontaminated.

i. The following storage and handling statements must appear on the labeling for all end-use products:

> Store in dry, cool, well-ventilated area under lock and key. Post as a pesticide storage area.
>
> Do not contaminate water, food or feed by storage. Store cylinders upright, secured to a rack or wall to prevent tipping. Cylinders should not be subjected to rough handling or mechanical shock such as dropping, bumping, dragging, or sliding. Do not use rope slings, hooks, tongs, or similar devices to unload cylinders. Transport cylinders using hand truck, fork truck or other device to which the cylinder can be firmly secured.
>
> Do not remove valve protection bonnet and safety cap until immediately before use. Replace safety cap and valve protection bonnet when cylinder is not in use.
>
> When cylinder is empty, close valve, screw safety cap onto valve outlet, and replace protection bonnet before returning to shipper. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose. Follow registrant's instructions for return of empty or partially empty cylinders.

j. The following pesticide disposal statement must appear on the labeling for all end use products:

> Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

5. Precautionary Statements for End-Use Products Intended for Structural, Transportation, Space or Commodity Fumigation

a. In addition to the use directions specified under Section 4 above, the following statements must appear on all end-use products intended for structural, transportation, space or commodity fumigation:

> When used for fumigation of enclosed spaces, [houses and other structures, warehouses, grain bins or elevators, vaults, chambers, greenhouses, trucks, vans, boxcars, ships, and other transport vehicles, and tarpaulin-covered areas or commodities], two persons trained in the use of this product must be present during introduction of the fumigant, initiation of aeration, and after aeration when testing for reentry. Two persons do not need to be present if monitoring is conducted remotely (outside the area being fumigated).
>
> Do not fumigate with this product when commodity temperature is below 40°F.
>
> [Specific directions for use follow. The registrant must provide complete directions for use of the product for fumigation of specified spaces, commodities, or structures].

b. The following placarding statements are required for all end-use products intended for structural, transportation, space, or commodity fumigation:

> The applicator must placard or post all entrances to the fumigated area with signs bearing, in English and Spanish:
>
> 1. The signal word DANGER/PELIGRO and the skull and crossbones symbol.
> 2. The statement, "Area under fumigation, DO NOT ENTER/NO ENTRE".
> 3. The date of fumigation.
> 4. Name of fumigant used.
> 5. Name, address, and telephone number of the applicator.

Only a certified applicator or someone under his/her supervision may remove placards, and only when the concentration of methyl bromide in the treated site or commodity is below 5 ppm. Any person who transfers a treated commodity to another site without aeration must ensure that the new site is placarded until the commodity is aerated below the threshold concentration.

c. The following respiratory protection statements must appear on the labeling for all end-use products intended for structural, transportation, space, or commodity fumigation:

"If the concentration of methyl bromide in the working area, as measured by [a direct-reading detector device], does not exceed 5 ppm (20 mg/M^3), no respiratory protection is required." [The registrant must identify one or more detector devices suitable for use with the product and provide or reference instructions on its use].

If this concentration is exceeded at any time, all persons in the fumigation area must wear protective clothing and a [NIOSH/ MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator]. [The registrant may instead identify a specific respiratory protection device to be used with the product].

d. The following aeration and reentry statements must appear on the labeling for all end-use products intended for structural, transportation, space, or commodity fumigation:

After fumigation, treated areas must be aerated until the level of methyl bromide is below 5 ppm. Do not allow entry into the treated area by any person before this time unless protective clothing and a respiratory protection device (SCBA or combination air-supplied/SCBA) is worn.

e. The following spill and leak procedures must appear on the labeling for all end-use products intended for structural, transportation, space, or commodity fumigation:

Evacuate immediate area of spill or leak. Use SCBA or combination air-supplied/SCBA respirator for entry into affected area to correct problem.

Move leaking or damaged cylinders or containers outdoors or to an isolated location, observing strict safety precautions. Work upwind if possible. Allow spill to evaporate. Do not permit entry into spill area by unprotected persons until concentration of methyl bromide is determined to be less than 5 ppm.

Contaminated soil, water, and other cleanup debris is a toxic hazardous waste. Report spill to the National Response Center (800-424-8802) if the reportable quantity of 1000 lbs. is exceeded.

6. Precautionary Statements for End-Use Products Intended for Soil Fumigation

a. The following precautions to be followed prior to fumigation must appear on the label or in the application manual for all end-use products intended for soil fumigation:

Comply with all local regulations and ordinances. Obtain an application permit from Agricultural Regulatory Agencies as required.

Never fumigate alone. It is imperative always to have an assistant and proper protective equipment in case of accidents.

Drivers of application equipment must advise other workers of all precautions and procedures. In addition, drivers must instruct their helpers in the mechanical operation of the tractor and how to safely work with the tractor and driver while fumigating.

Handle this fumigant in the open, with the operator "up wind" from the container where there is good ventilation.

Check fumigant pressure system for leaks before beginning operation.

Two trained persons must be present during introduction of the fumigant.

When fumigating soil from a tractor, 5 gallons of water must be carried on the tractor and placed where it is readily accessible. In addition to water available on the tractor, at least 5 gallons additional water must be available from the service truck. This water must be potable and in containers marked "Decontamination water not to be used for drinking."

All trash should be cleared from the field before starting fumigation.

b. The following precautions to be followed during fumigation must appear on the label or in the application manual for all end-use products intended for soil fumigation:

This fumigant should not be applied when there is an atmospheric inversion. Since uncomfortable concentrations of chloropicrin may drift to nearby areas, immediately cover treated area with plastic tarpaulin for a minimum of 48 hours.

Do not lift injection shanks to turn at the end of a pass until fumigant has drained from system following closure of shutoff valve.

If trash is inadvertently pulled by the shanks to the ends of the field when fumigating, it must be covered by lifting the shanks, then covering the trash with polyethylene film before making the turn for the next pass.

When changing the cylinders, be certain they are turned off and fumigant system is not under pressure.

c. The following precautions to be followed after fumigation must appear on the label or in the application manual for all end-use products intended for soil fumigation:

Post all treated areas with warning signs.

Keep all animals, children and unauthorized people away from area under fumigation for 48 hours after fumigation and during removal of tarpaulin.

Two trained persons must be present during removal of the tarpaulin.

d. The following spill and leak procedures must appear on the label or in the application manual for all all end-use products intended for soil fumigation:

> In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Evacuate immediate area of spill or leak. Use SCBA or combination air-supplied/SCBA respirator for entry into affected area to correct problem. Approach from upwind to make necessary repairs. Do not reenter area without respiratory protection until a spill has evaporated or a leak has been fixed.

V. PRODUCTS SUBJECT TO THIS STANDARD

All products containing methyl bromide are subject to certain requirements for data submission or changes in composition, labeling or packaging of the product. The applicable requirements depend on whether the product is a manufacturing or end use product and whether the pesticide is the sole active ingredient or one of multiple active ingredients.

Products are subject to this Registration Standard as follows:

A. Manufacturing use products containing methyl bromide as the sole active ingredient are subject to:

1. The restrictions (if any) upon use, composition, or packaging listed in Section IV, if they pertain to the manufacturing use product.

2. The data requirements listed in Tables A and B[2]

3. The labeling requirements specified for manufacturing use products in Section IV.

4. Administrative requirements (application forms, Confidential Statement of Formula, data compensation provisions) associated with reregistration.

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[2] Data requirements are listed in the two Tables in Appendix I of this Registration Standard. The Guide to Tables in that Appendix explains how to read the Tables.

Table A lists generic data requirements applicable to all products containing methyl bromide Table B lists product-specific data applicable to manufacturing use products. The data in Tables A and B need not be submitted by a producer who is eligible for the formulator's exemption for methyl bromide.

B. Manufacturing use products containing methyl bromide in combination with other active ingredients are subject to:

The data requirements listed in Table A.

C. End use products containing methyl bromide alone or in combination with other active ingredients are subject to:

1. The restrictions (if any) upon use, composition, or packaging listed in Section IV if they pertain to the end use product.

2. If not eligible for the formulator's exemption[3], the data requirements listed in Table A.

3. The labeling requirements specified for end use products in Section IV.

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[3] If you purchase from another producer and use as the source of your active ingredient only EPA-registered products, you are eligible for the formulator's exemption for generic data concerning that active ingredient (Table A) and product-specific data for the registered manufacturing use product you purchase (Table B).

Two circumstances nullify this exemption:

1) If you change sources of active ingredient to an unregistered product, formulate your own active ingredient, or acquire your active ingredient from a firm with ownership in common with yours, you lose the exemption and become subject to the data requirements in Table A.

2) If no producer subject to the generic data requirements in Table A agrees to submit the required data, all end use producers lose the exemption, and become subject to those data requirements.

VI. REQUIREMENT FOR SUBMISSION OF GENERIC DATA

This portion of the Registration Standard is a notice issued under the authority of FIFRA sec. 3(c)(2)(B). It refers to the data listed in Table A, which are required to be submitted by registrants to maintain in effect the registration of products containing this active ingredient.[4]

A. What are generic data?

Generic data pertain to the properties or effects of a particular active ingredient. Such data are relevant to an evaluation of all products containing that active ingredient regardless of whether the product contains other ingredients. (unless the product bears labeling that would make the data requirement inapplicable).

Generic data may also be data on a "typical formulation" of a product. "Typical formulation" testing is often required for ecological effects studies and applies to all products having that formulation type. These are classed as generic data, and are contained in Table A.

B. Who must submit generic data?

All current registrants are responsible for submitting generic data in response to a data request under FIFRA sec. 3(c)(2)(B) (DCI Notice). EPA has decided, however, not to require a registrant who qualifies for the formulator's exemption (FIFRA sec. 3(c)(2)(D) and § 152.85) to submit generic data in response to a DCI notice if the registrant who supplies the active ingredient in his product is complying with the data request.

If you are not now eligible for a formulator's exemption, you may qualify for one if you change your source of supply to a registered source that does not share ownership in common with your firm. If you choose to change sources of supply, the Confidential Statement of Formula must identify the new source(s) and you must submit a Formulator's Exemption Statement form.

If you apply for a new registration for products containing this active ingredient after the issuance of this Registration Standard, you will be required to submit or cite generic data relevant to the uses of your product if, at the time the application is submitted, the data have been submitted to the Agency by current registrants. If the required data have not yet been submitted, any new registration will be conditioned upon the new registrant's submission or citation of the required data not later than the date upon which current registrants of similar products are required to provide such data. See FIFRA sec. 3(c)(7)(A). If you thereafter fail to comply with the condition of that registration to provide data, the registration may be cancelled (FIFRA sec. 6(e)).

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[4] Registrations granted after issuance of this Standard will be conditioned upon submission or citation of the data listed in this Registration Standard.

C. What generic data must be submitted?

You may determine which generic data you must submit by consulting Table A. That table lists the generic data needed to evaluate current uses of all products containing this active ingredient, the uses for which such data are required, and the dates by which the data must be submitted to the Agency.

D. How to comply with DCI requirements.

Within 90 days of your receipt of this Registration Standard, you must submit to EPA a completed copy of the form entitled "FIFRA Section 3(c)(2)(B) Summary Sheet" (EPA Form 8580-1, enclosed) for each of your products. On that form you must state which of the following six methods you will use to comply with the DCI requirements:

1. You will submit the data yourself.

2. You have entered into an agreement with one or more registrants to jointly develop (or share in the cost of developing) the data, but will not be submitting the data yourself. If you use this method, you must state who will submit the data on which you will rely. You must also provide EPA with documentary evidence that an agreement has been formed which allows you to rely upon the data to be submitted. Such evidence may be: (1) your letter offering to join in an agreement and the other registrant's acceptance of your offer, (2) a written statement by the parties that an agreement exists, or (3) a written statement by the person who will be submitting the data that you may rely upon its submission. The Agency will also require adequate assurance that the person whom you state will provide the data is taking appropriate steps to secure it. The agreement to produce the data need not specify all of the terms of the final arrangement between the parties or a mechanism to resolve the terms.

3. You have attempted to enter into an agreement to jointly develop data, but no other registrant has accepted your offer. You request that EPA not suspend your registration for non-compliance with the DCI. EPA has determined that, as a general policy, it will not suspend the registration of a product when the registrant has in good faith sought and continues to seek to enter into a data development/cost sharing program, but the other registrants developing the data have refused to accept its offer. [If your offer is accepted, you may qualify for Option 2 above by entering into an agreement to supply the data.]

In order to qualify for this method, you must:

1. File with EPA a completed "Certification of Attempt to Enter into an Agreement with other Registrants for Development of Data" (EPA Form 8580-6, enclosed).

2. Provide us with a copy of your offer to the other registrant and proof of the other registrant's receipt of your offer (such as a certified mail receipt). Your offer must, at a minimum, contain the following language or its equivalent:

> [Your company name] offers to share in the burden of producing the data required pursuant to FIFRA sec. 3(c)(2)(B) in the [name of active ingredient] Registration Standard upon terms to be agreed or failing agreement to be bound by binding arbitration as provided by FIFRA section 3(c)(2)(B)(iii).

The remainder of your offer may not in any way attempt to limit this commitment. If the other registrant to whom your offer is made does not accept your offer, and if the other registrant informs us on a DCI Summary Sheet that he will develop and submit the data required under the DCI, then you may qualify for this option. In order for you to avoid suspension under this method, you may not later withdraw or limit your offer to share in the burden of developing the data. In addition, the other registrant must fulfill its commitment to develop and submit the data.

4. You request a waiver of the data requirement. If you believe that a data requirement does not (or should not) apply to your product or its uses, you must provide EPA with a statement of the reasons why you believe this is so. Your statement must address the specific composition or use factors that lead you to believe that a requirement does not apply. Since the Agency has carefully considered the composition and uses of pesticide products in determining that a data requirement applies, EPA does not anticipate that many waivers will be granted. A request for waiver does not extend the timeframes for developing required data, and if your waiver request is denied, your registration may be suspended if you fail to submit the data.

5. You request that EPA amend your registration by deleting the uses for which the data are needed. You are not required to submit data for uses which are no longer on your label.

6. You request voluntary cancellation of the registration of your product(s) for which the data are needed.

E. Procedures for requesting a change in testing protocol.

If you will generate the required data and plan to use test procedures which deviate from (or are not specified in) either EPA's Pesticide Assessment Guidelines or the Reports of Expert Groups to the Chemicals Group, Organization for Economic Cooperation and Development (OECD) Chemicals Testing Programme, you must submit for EPA approval the protocols you propose to use.

You should submit your protocols before beginning testing and await EPA approval, because the Agency will not ordinarily accept as sufficient studies using unapproved protocols. A request for protocol approval will not extend the timeframe for submission of the data, nor will extensions generally be given to conduct studies due to submittal of inappropriate protocols.

F. Procedures for requesting extensions of time.

If you think that you will need more time to generate the data than is allowed by EPA's schedule, you may submit a request for an extension of time. Any request for a time extension which is made as an initial response to a section 3(c)(2)(B) request notice must be submitted in writing to the Product Manager listed at the end of this section and must be made before the deadline for response. Once dates have been committed to and EPA has accepted these commitments, any subsequent requests for a time extension must be submitted in writing to the Office of Compliance Monitoring.

EPA will view failure to request an extension before the response deadline as a waiver of any future claim that there was insufficient time to submit the data. While EPA considers your request, you must strive to meet the deadline for submitting the data.

The extension request should state the reasons why you believe that an extension is necessary and the steps you have taken to meet the testing deadline. Time extensions normally will not be granted due to problems with laboratory capacity or adequacy of funding, since the Agency believes that with proper planning these can be overcome. Time extensions may be considered when joint data development is planned, or when the Agency must approve a new or modified protocol before the study can be begun.

A request for an extension does not extend the timeframe for submission of the data. If EPA denies your request for a time extension and you do not submit the data as requested, EPA may begin proceedings to suspend the registrations of your products.

G. Existing stocks provision upon suspension or cancellation.

The Agency has determined that if a registration is suspended for failure to respond to a DCI request under FIFRA sec. 3(c)(2)(B), an existing stocks provision is not consistent with the Act. Accordingly, the Agency does not anticipate granting permission to sell or distribute existing stocks of suspended product except in rare circumstances. If you believe that your product will be suspended or cancelled and that an existing stocks provision should be granted, you have the burden of clearly demonstrating to EPA that granting such permission would be consistent with the Act. The following information must be included in any request for an existing stocks provision:

1. Explanation of why an existing stocks provision is necessary, including a statement of the quantity of existing stocks and your estimate of the time required for their sale or distribution; and

2. Demonstration that such a provision would be consistent with the provisions of FIFRA.

VII. REQUIREMENT FOR SUBMISSION OF PRODUCT-SPECIFIC DATA

Under the authority of section 3(c)(2)(B) of FIFRA, EPA has determined that certain product-specific data are required to maintain your registrations in effect. Product-specific data are derived from testing using a specific formulated product, and, unlike generic data, generally support only the registration of that product. All such data must be submitted by the dates specified in this Registration Standard.

If you have a manufacturing use product, these data are listed in Table B. As noted earlier, the Agency has decided that it will not routinely require product-specific data for end use products at this time.

In order to comply with the product specific data requirements, you must follow the same procedures as for generic data. See Section IV.D, E, F, and G. You should note, however, that product chemistry data are required for every product, and the only acceptable responses are options IV.D.1. (submit data) or IV.D.6. (cancellation of registration).

Failure to comply with the product-specific data requirements for your products will result in suspension of the product's registration.

VIII. REQUIREMENT FOR SUBMISSION OF REVISED LABELING

FIFRA requires each product to be labeled with accurate, complete and sufficient instructions and precautions, reflecting the Agency's assessment of the data supporting the product and its uses. General labeling requirements are set out in 40 CFR 162.10 (see Appendix II - LABELING and SUMMARY). In addition, labeling requirements specific to products containing methyl bromide are specified in Section IV.D of this Registration Standard. Applications submitted in response to this notice must include draft labeling for Agency review.

If you fail to submit revised labeling as required, which complies with 40 CFR 162.10 and the specific instructions in Section IV.D., EPA may seek to cancel or suspend the registration of your product under FIFRA sec. 6.

IX. INSTRUCTIONS FOR SUBMISSION

A. Manufacturing Use Products (MUPs) containing Methyl Bromide as the sole active ingredient.

1. Within 90 days from receipt of this document, you must submit to the Product Manager in the Registration Division for each product subject to this Registration Standard:

a. The "FIFRA Section 3(c)(2)(B) Summary Sheet" (EPA Form 8580-1), with appropriate attachments.[5]

b. Confidential Statement of Formula (EPA Form 8570-4).

c. Formulator's Exemption Statement, if applicable.

d. Evidence of compliance with data compensation requirements of FIFRA sec. 3(c)(1)(D). Refer to 40 CFR 152.80-152.99.

e. Three copies of draft labeling, including the container label and any associated supplemental labeling. Labeling should be either typewritten text on 8-1/2 x 11 inch paper or a mockup of the labeling suitable for storage in 8-1/2 x 11 files. The draft label must indicate the intended colors of the final label, clear indication of the front panel of the label, and the intended type sizes of the text.

2. Within 9 months from receipt of this document you must submit to the Product Manager:

a. Application for Pesticide Registration (EPA Form 8570-1).

b. Two copies of any required product-specific data (See Table B).

c. Product Specific Data Report.

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[5] If on the Summary Sheet, you commit to develop the data, present arguments that a data requirement is not applicable or should be waived, or submit protocols or modified protocols for Agency review, you must submit a copy of the Summary Sheet (and any supporting information) to the Office of Compliance Monitoring, which will be monitoring the data generated in response to this notice. This submission is in addition to responding to the Product Manager, and should be submitted to the Office of Compliance Monitoring at the address given at the end of this section. (Actual studies are not to be submitted to the Office of Compliance Monitoring.)

3. Within the times set forth in Table A, you must submit to the Registration Division all generic data, unless you are eligible for the formulator's exemption. If for any reason any test is delayed or aborted so that the schedule cannot be met, immediately notify the Product Manager and the Office of Compliance Monitoring of the problem, the reasons for the problem, and your proposed course of action.

B. Manufacturing Use Products containing Methyl Bromide in combination with other active ingredients.

1. Within 90 days from receipt of this document, you must submit to the Product Manager in the Registration Division:

a. FIFRA sec. 3(c)(2)(B) Summary Sheet, with appropriate attachments[5] (EPA Form 8580-1).

b. Confidential Statement of Formula (EPA Form 8570-4)

c. Formulator's Exemption Statement, if applicable.

2. Within the time frames set forth in Table A, you must submit to the Registration Division all generic data, unless you are eligible for the formulator's exemption. If for any reason any test is delayed or aborted so that the schedule cannot be met, immediately notify the Product Manager and the Office of Compliance Monitoring of the problem, the reasons for the problem, and your proposed course of action.

C. End Use Products containing Methyl Bromide alone or in combination with other active ingredients.

1. Within 90 days from receipt of this document, you must submit to the Product Manager in the Registration Division:

a. FIFRA Section 3(c)(2)(B) Summary Sheet, with appropriate attachments[5] (EPA Form 8580-1).

b. Confidential Statement of Formula (EPA Form 8570-4).

c. Formulator's Exemption Statement, if applicable.

2. Within 90 days from receipt of this document you must submit to the product manager in the Registration Division:

Three copies of draft labeling, including the container label and any associated supplemental labeling. Labeling should be either typewritten text on 8-1/2 x 11 inch paper or a mockup of the labeling suitable for storage in 8-1/2 x 11 files. The draft labeling must indicate the intended colors of the final label, clear indication of the front panel of the label, and the intended type sizes of the text. End use product labeling must comply specifically with the instructions in Section IV (Regulatory Position and Rationale).

D. Intrastate Products containing Methyl Bromide either as sole active ingredient or in combination with other active ingredients.

These products are being called in for full Federal registration. Producers of these products are being sent a letter instructing them how to submit an application for registration.

E. Addresses

The required information must be submitted to the following address:

Jeff Kempter, Acting PM-32
Registration Division (TS-767C)
Office of Pesticide Programs
Environmental Protection Agency
401 M St., SW
Washington, DC 20460

The address for submissions to the Office of Compliance Monitoring is:

Laboratory Data Integrity Program
Office of Compliance Monitoring (EN-342)
Environmental Protection Agency
401 M St., SW
Washington, DC 20460.

GUIDE TO TABLES

Tables A and B contain listings of data requirements for the pesticides covered by this Registration Standard.

Table A contains generic data requirements that apply to the pesticide in all products, including data requirements for which a "typical formulation" is the test substance.

Table B contains product-specific data requirements that apply only to a manufacturing use product.

The data tables are generally organized according to the following format:

1. Data Requirement (Column 1). The data requirements are listed in the order in which they appear in 40 CFR Part 158. The reference numbers accompanying each test refer to the test protocols set out in the Pesticide Assessment Guidelines, which are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

2. Test Substance (Column 2). This column lists the composition of the test substance required to be used for the test, as follows:

TGAI = Technical grade of the active ingredient
PAI = Pure active ingredient
PAIRA = Pure active ingredient, radio labeled
TEP = Typical end use formulation
MP = Manufacturing use product
EP = End use product

Any other test substances, such as metabolites, will be specifically named in Column 2 or in footnotes to the table.

3. Use pattern (Column 3). This column indicates the use patterns to which the data requirement applies. Use patterns are the same as those given in 40 CFR Part 158. The following letter designations are used for the given use patterns:

A = Terrestrial, food
B = Terrestrial, non-food
C = Aquatic, food
D = Aquatic, non-food
E = Greenhouse, food
F = Greenhouse, non-food
G = Forestry
H = Domestic outdoor
I = Indoor

Any other designations will be defined in a footnote to the table.

4. Does EPA have data? (Column 4). This column indicates one of three answers:

> YES - EPA has data in its files that completely satisfy this data requirement. These data may be cited by other registrants in accordance with data compensation requirements of Part 152, Subpart E.
>
> PARTIALLY - EPA has some data in its files, but such data do not fully satisfy the data requirement. In some cases, the Agency may possess data on one of two required species, or may possess data on one test substance but not all. The term may also indicate that the data available to EPA are incomplete. In this case, when the data are clarified, or additional details of the testing submitted by the original data submitter, the data may be determined to be acceptable. If this is the case, a footnote to the table will usually say so.
>
> NO - EPA either possesses no data which are sufficient to fulfill the data requirement, or the data which EPA does possess are flawed scientifically in a manner that cannot be remedied by clarification or additional information.

5. Bibliographic citation (Column 5). If the Agency has acceptable data in its files, this column lists the identifying number of each study. This normally is the Master Record Identification (MRID) number, but may be a GS number if no MRID number has been assigned. Refer to the Bibliography Appendices for a complete citation of the study.

6. Must additional data be submitted? (Column 6). This column indicates whether the data must be submitted to the Agency. If column 3 indicates that the Agency already has data, this column will usually indicate NO. If column 3 indicates that the Agency has only partial data or no data, this column will usually indicate YES. In some cases, even though the Agency does not have the data, EPA will not require its submission because of the unique characteristics of the chemical; because data on another chemical can be used to fulfill the data requirement; or because the data requirement has been waived or reserved. Any such unusual situations will be explained in a footnote to the table.

7. Timeframe for submission (Column 7). If column 5 requires that data be submitted, this column indicates when the data are to be submitted, based on the issuance date of the Registration Standard. The timeframes are those established either as a result of a previous Data Call-In letter, or standardized timeframes established by PR Notice 85-5 (August 22, 1985).

8. Footnotes (at the end of each table). Self-explanatory.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation1/	Must Additional Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry						
Product Identity						
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All		N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All		N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis	TGAI	All		N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All		N/A	Yes	6 Months
63-3 - Physical State	TGAI	All		N/A	Yes	6 Months
63-4 - Odor	TGAI	All		N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All		N/A	No2/	
63-6 - Boiling Point	TGAI	All		N/A	No2/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation1/	Must Additional Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
Physical and Chemical Characteristics (Continued)						
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All		N/A	Yes	6 Months
63-8 - Solubility	TGAI or PAI	All		N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI	All		N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI	All		N/A	No3/	
63-11 - Octanol/Water Partition Coefficient	PAI	All		N/A	Yes	6 Months
63-12 - pH	TGAI	All		N/A	Yes	6 Months
63-13 - Storage Stability	TGAI	All		N/A	Yes	15 Months
Other Requirements:						
64- 1 - Submittal of Samples	TGAI or PAI	All		N/A	Yes	6 Months

: :

1/ Not applicable. Although product chemistry data may have been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ Not required because the technical material is a gas at room temperature.

3/ Not required because methyl bromide is nonionic.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry						
171-4 - Nature of Residue (Metabolism)						
- Plants	PAIRA	A	Partially	00065237,00079550	Yes1/2/	12 Months
- Livestock	PAIRA & Plant Metabolites	A	No		Reserved3/	
171-4 - Residue Analytical Method						
- Plant residues	TGAI & Metabolites	A	Partially	00026180,00043601 00079041,00112926 00118768,00118838 00149535,00152907 00153317,00160629	Yes4/5/	18 Months
- Animal residues	TGAI & Metabolites	A	No		Reserved6/	
171-4 - Storage Stability Data	PAI	A	Partially	00153317	Yes7/	18 Months

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry - Continued						
171-4 - Magnitude of the Residue - Residue Studies8/9/						
- Root and Tuber Vegetables Group	TEP	A	Partially	00088683,00089457 00090408,00119550 00152907,00153317	Yes10/	24 Months
° Jerusalem Artichokes			No		Yes11/	24 Months
° Ginger Roots			Partially	00090408,00119550	Yes11	24 Months
° Horseradish			No		Yes11/	24 Months
° Parsnip Roots			No		Yes11/	24 Months
° Salsify Roots			No		Yes11/	24 Months
- Bulb Vegetables Group	TEP	A	Partially	00079043,00088683 00089457,00152907 00153317	Yes12/	24 Months
- Leafy Vegetables Group	TEP	A	Partially	00079048,00152907 00157445	Yes13/	24 Months

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry - Continued						
171-4 - **Magnitude of the Residue - Residue Studies**						
- **Brassica Leafy Vegetables Group**	TEP	A	Partially	00013057,00140445 00152907,00153317 00157445	Yes14/15/	24 Months
- **Legume Vegetables Group**	TEP	A	Partially	00088683,00089457 00118817,00127221 00152907,00153317	Yes16/	24 Months
- **Fruiting Vegetables (Except Cucurbits) Group**	TEP	A,E	Partially	00013000,00013057 00088683,00089457 00118837,00135683 00152907,00153317	Yes17/	24 Months
- **Cucurbit Vegetables Group**	TEP	A	Partially	00013057,00089457 00152907,00153317	Yes18/	24 Months
- **Citrus Fruits Group**	TEP	A	Partially	00066267,00089457 00153317	Yes19/	36 Months
- **Pome Fruits Group**	TEP	A	Partially	00088683,00118837 00153317,00160628	Yes20/	36 Months
- **Stone Fruits Group**	TEP	A	Partially	00089457,00149535 00153317,00160628	Yes21/	36 Months

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry - Continued						
171-4 - Magnitude of the Residue - Residue Studies						
- Small Fruits And Berries Group	TEP	A	Partially	00012999,00013057 00089457,00096432 00118829,00118845 00127767,00149535 00152907,00153317	Yes22/	24 Months
- Tree Nuts Group	TEP	A	Partially	00088683,00118821 00119256,00149535 00153317	Yes23/	36 Months
- Cereal Grains Group	TEP	A	Partially	00088683,00089457 00090269,00109713 00118817,00118820 00118838,00149535 00153317	Yes24/	24 Months
- Nongrass Animal Feeds Group	TEP	A	Partially	00088683,00118830	Yes25/	24 Months
- Herbs and Spices Group	TEP	A	Partially	00090408,00118838 00119550,00152907 00153317,00160627	Yes26/	24 Months

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry - Continued						
171-4 - Magnitude of the Residue - Residue Studies						
- Miscellaneous Commodities						
° Asparagus	TEP	A	Partially	00079048,00090147	Yes27/	24 Months
° Avocados	TEP	A	Partially	00135683	Yes28/	24 Months
° Cocoa Beans	TEP	A	Partially	00088683,00153317	Yes29/	24 Months
° Coffee Beans	TEP	A	Partially	00090408,00119550 00153317	Yes30/	24 Months
° Copra	TEP	A	Partially	00089457,00118838	Yes31/	24 Months
° Cottonseed	TEP	A	Partially	00088683	Yes32/	24 Months
° Okra	TEP	A	Partially	00152907	Yes33/	24 Months

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry - Continued						
171-4 - Magnitude of the Residue - Residue Studies						
° Peanuts	TEP	A	Partially	00088683,00089066 00109713,00119256 00125059	Yes34/	24 Months
° Pineapples	TEP	A	Partially	00012908	Yes35/	24 Months
° Pistachio Nuts	TEP	A	Partially	00149535	Yes36/	24 Months
° Tobacco	TEP	B	Partially	00153317	Yes37/	24 Months
° Processed Foods	TEP	N/A	Partially	00088683,00109713 00118817,00118837 00118838,00153317	Yes38/	24 Months
° Meat/Milk Poultry/Eggs	TGAI or Plant Metabolites	N/A	Partially	00090270,00090271 00118825	Reserved39/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

1/ Representative raw agricultural commodities, harvested according to common commercial procedures, are to be fumigated with [^{14}C]-methyl bromide at or above the maximum registered rate and under conditions comparable to those specified in the label directions. Considering the relatively brief duration of these studies, the use of [^{14}C, $^{74-90}$Br] double-labeled methyl bromide may be feasible (half-lives of the various isotopes of Br are 1.6 sec to 57 hr). In addition to methyl bromide per se (MeBr per se) and inorganic bromide ion (iBr), methylated and brominated derivatives of natural plant constituents produced upon fumigation must be characterized, particularly such products as purine and pyrimidine bases. It is advisable to combine the metabolism study with storage stability and method recovery studies as an optimal means of validating the residue data. Representative members of at least the following crop groups [as defined in 40 CFR 180.34(f)] must be tested: root and tuber vegetables, tree nuts, cereal grains (corn and a small grain), citrus fruits, pome or stone fruits, and nongrass animal feeds. The major crops in the above or other groups must be included.

2/ If the plant metabolism studies (postharvest commodity fumigation) reveal the formation of residues of concern other than methyl bromide per se and bromide ion, then preplant soil fumigation type plant metabolism studies may also be required.

3/ May be required if the plant metabolism studies reveal the presence of residues of concern in raw agricultural commodities used for animal feed.

4/ Bromide analysis - Fortification/recovery data validating the methods of Shrader et al. (Method Pr 6e-64), Heuser and Scudamore (IR-4), and Abdalla and Lear as well as Method SSL 57.3, Method ML-AM-69-57, and the WIL 84:7 procedure. Individual values must be reported for each food/feed analyzed; Methyl bromide analysis - Fortification/recovery data validating the WIL 84:7 procedure. Individual values must be reported for each food/feed analyzed; Neutron activation analysis - This method must be described in detail and it must be specified whether the X-ray diffraction or the oxidation/titration method was used.

5/ If the requested plant metabolism studies reveal the presence of additional metabolites of concern, then residue analytical methods may be required to determine these residues in RAC's and/or processed products.

6/ If residues of concern are detected in the reserved animal metabolism studies, then feeding studies will be required to determine the necessity and levels of any tolerances.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

7/ Representative fumigated and/or spiked commodities must be analyzed for iBr at various intervals following the end of the aeration time prescribed on registered labels. The end of aeration will represent time zero. Untreated controls should be included as a means of determining background levels of iBr. A validated method of analysis must be used. It should also be noted that all residue data (iBr and methyl bromide per se) in this Standard must be accompanied by data regarding storage length and conditions of storage of samples analyzed. These data must be accompanied by data depicting stability of residues under the conditions and for the intervals specified.

8/ In the event that the requested plant metabolism studies reveal the presence of new metabolites of concern, then representative data will be required (upon receipt of the metabolism studies) showing the residues of these metabolites in or on treated foods or feeds.

9/ Preplant soil fumigation data have been submitted which indicate that the Indiana (and perhaps Oklahoma) soil(s) in which crops were grown may not be typical. Several crops grown in these soils (root crops, lettuce, succulent beans, tomatoes, peppers, and watermelon) contained unusually high levels of inorganic bromides (iBr) compared with other States tested. Therefore, the reason(s) for the unusually high inorganic bromide (iBr) levels in crops grown in Indiana (and perhaps Oklahoma) soil fumigated preplant must be provided. Soil profiles, treatment histories, and any other pertinent data should accompany the explanation.

10/ Postharvest commodity f[illegible]ation of each registered raw agricultural commodity (RAC) at the maximum registered rate and for the max[illegible]egistered exposure period as listed in the EPA Index to Pesticide Chemicals (Appendix III) must be submitt[illegible]f crop group tolerances for iBr and MeBr per se are to be sought, then only data (reflecting the maxi[illegible]ates and exposure periods) for carrots, potatoes, radishes, and sugar beets need be submitted. Several [illegible]rials must be conducted for each RAC to be tested; these trials must represent the major application methods and, in the case of chambers, two or more commercial types of units must be used. These application methods should at least be commercial fumigation chambers (atmospheric pressure and partial vacuum); railroad cars; trucks, vans, or trailers (whichever is the most prevalent); and simple tarpaulin fumigation (stacking of the RAC and covering with a gasproof film). Processed products of potatoes and sugar beets derived from fumigated RAC's (bearing measurable residues) must also be analyzed to determine if concentration of iBr or MeBr per se occurs. For preplant soil fumigation use, samples must be first grown in fumigated soil and then fumigated postharvest at the maximum rates. If one or two fumigation methods predominate the commercial market, then only the major techniques must be tested provided that the petitioner provides evidence supporting this claim (and perhaps a label restriction). If one or more members of this crop group [even if not one of the four representative commodities listed in 40 CFR 180.34 (f)] are more than occasionally (perhaps $\geq$ 5 percent of the fumigated crop) multiply-treated, then several postharvest fumigations of the same samples must occur prior to analysis. It is advisable that the petitioner propose minimum aeration times for each RAC if MeBr residues are detected.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

11/ Although iBr tolerances and registered uses exist for Jerusalem artichokes, ginger roots, horseradish, parsnip roots, and salsify roots, the residue data for ginger roots is insufficient and no residue data for the other commodities supporting these tolerances are available for review. If the petitioner wishes to retain these individual uses/tolerances, then residue data supporting tolerances for both iBr and MeBr per se must be submitted for each of these crops. If a crop group tolerance is desired, then the petitioner must satisfy all requirements listed under footnote 13.

12/ Bulb onions are to be grown in soil fumigated at 300 lb ai/A in CA and OR and at 240 lb ai/A in CO, NY, and TX, analyzed for iBr and MeBr per se, then fumigated postharvest at 3 lb ai/1000 ft^3 for 6 hours (large dry bulb onions) or 4 lb ai/1000 ft^3 for 4 hours (cipollini or small onion bulbs), and then analyzed again for iBr and MeBr per se. Garlic must be fumigated only postharvest at 3 lb ai/1000 ft^3 for 4 hours (atmospheric) and 4 lb ai/1000 ft^3 for 4 hours (vacuum) and analyzed for both iBr and MeBr per se. Several trials should be conducted for garlic and onions and postharvest fumigations must be conducted in all of the following sites unless they are not used commercially: chambers (atmospheric and reduced pressure); railroad cars; trucks, vans, or trailers; and simple tarpaulin-covered stacks. If multiple treatments of $\geq$ 5 percent of any member of this crop group occurs, then data must reflect these. Aeration times must be proposed if MeBr residues are detected.

13/ MeBr per se must be sought at the 400 lb ai/A rate (1X) in CA and both leaf and head lettuce must be tested. Also, the petitioner/registrant must specify whether the iBr data submitted to date for lettuce represent leaf or head lettuce (or both). If the iBr data submitted thus far do not include both lettuce types, then additional data will be required. If the petitioner/registrants do not wish the CA use limitation to apply to all products, then additional studies must be conducted in AZ and FL which produce 18.7 percent and 3.8 percent, respectively, of the lettuce crop according to the 1984 Agricultural Statistics (p. 160; CA produces 69.4%). Celery, lettuce, and spinach are to be fumigated postharvest at 4 lb ai/1000 ft^3 for 2 hours in a chamber at normal atmospheric pressure as per the USDA Section 18 quarantine use. MeBr per se and iBr must be determined. Aeration should occur until MeBr per se is nondetectable (at least < 0.01 to < 0.001 ppm). If a crop group tolerance is sought, then data on spinach will be required (application types and rates to be proposed by registrants) as well as the following data on celery: preplant soil applications (presumably at the 240 lb ai/A rate proposed in PP#5F3198) made in FL (21.8% of U.S. crop) and MI (7.4%), making sure that the maximum rate is used and that both iBr and MeBr per se are sought.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

14/ Broccoli and cauliflower must be analyzed for iBr and MeBr *per se* following preplant soil fumigation at 240 lb ai/A in CA and AZ. Cauliflower must also be treated in NY and OR. Broccoli, cabbage, and mustard greens are to be fumigated postharvest at 4 lb ai/A 1000 ft^3 for 2 hours in a chamber at normal atmospheric pressure as per the USDA Section 18 quarantine use. MeBr *per se* and iBr must be sought. Aeration should occur until MeBr *per se* is nondetectable (at least < 0.01 to < 0.001 ppm). If crop group tolerances are sought, then data must also be submitted for mustard greens. Broccoli, cabbage, and mustard greens (or a suitable substitute if greens are not fumigated postharvest) must be treated both preplant and postharvest at the maximum rates; iBr and MeBr *per se* must be sought after each fumigation.

15/ Data were presented for brussels sprouts, chinese cabbage, collard greens, kale, and mustard greens. However, no tolerances or registered uses exist for these crops. Therefore, the data are only useful for supporting the crop group tolerances proposed in PP#5F3198 and PP#5F3300. Mustard greens are one of three representative commodities (other than cabbage and broccoli) listed for this crop group in 40 CFR 180.34(f). Due to the very high iBr levels found in mustard greens grown in fumigated IN and OK soil (648 to 1360 ppm), further testing should occur in CA (17.8%), TX (12.1%), and AZ (12%) if a crop group tolerance is desired. The parenthetic numbers are percentages of U.S. acreage of mustard greens harvested (from 1982 Census of Agriculture).

16/ Succulent and dried beans must be fumigated postharvest at 3.5 lb ai/1000 ft^3 for 24 hours, dried peas at 4 lb ai/1000 ft^3 for 24 hours, and succulent peas at 3 lb ai/1000 ft^3 for 2 hours. Several methods of fumigation must be used for each commodity including chamber (atmospheric and reduced pressure); truck, van, or trailer; boxcar; and simple tarpaulin-covered stacks. Repeat fumigations (at least in the case of dried beans and peas) must be conducted if commercially practiced. At least lima and a smaller *Phaseolus* spp. should be fumigated as well as succulent peas (*Pisum* spp.) and dried southern peas (*Vigna* spp.). If a crop group tolerance is desired, then soybean data must also be submitted which reflect some proposed application rate and exposure period. Both iBr and MeBr *per se* must be sought in all cases. Prior to approval of preplant soil fumigation uses (PP#5F3198), samples of the above commodities must be grown in soil fumigated at the maximum rate in the major growing areas, then analyzed for iBr and MeBr *per se*, then fumigated postharvest at the maximum rate using several methods of fumigation, and then reanalyzed for MeBr *per se* and iBr. Aeration periods should be proposed for inclusion on the label for postharvest fumigations. If the soybean data is developed, then a processing study must be conducted to determine if iBr or MeBr *per se* concentrates in any processed product(s). [Processed products must be derived from soybeans bearing measurable weathered residues of MeBr *per se* and iBr.] Calibration curves must be submitted for all crops analyzed for MeBr *per se* by the method of King et al. for validation purposes.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

17/ Eggplant, peppers, and tomatoes must be grown in soil fumigated preplant at 240 lb ai/A in geographically representative areas and then analyzed for MeBr per se and iBr. Tomatoes should also be greenhouse grown in soil fumigated preplant at 240 lb ai/A. The samples grown in treated soil must then be fumigated postharvest at 3 lb ai/1000 ft^3 (eggplant and tomatoes) or 4 lb ai/1000 ft^3 for 2 hours (peppers) and, after suitable aeration periods, analyzed again for iBr and MeBr per se. The most commercially prevalent methods of postharvest fumigation (e.g., boxcar, vacuum, tarpaulin) must be tested as well as repeat applications, if practiced commercially. Label restrictions may be required to prevent preplant soil fumigation in areas having soil such as that in IN which, for many commodities, results in unusually high iBr residues. If a crop group tolerance is sought, then the eggplant data gap does not apply. A tomato processing study must be conducted to determine if residues of iBr or MeBr per se concentrate in any processed product(s) and to support the 250 ppm tolerance for iBr in concentrated tomato products (21 CFR 193.250). [Processed products must be derived from tomatoes bearing measurable weathered residues of iBr and MeBr per se.] MeBr per se data for tomatoes determined using the King et al. method must be validated by the submission of a calibration curve.

18/ Cantaloupes, cucumbers, muskmelons, pumpkins, squash (winter and summer), and watermelons must be fumigated postharvest at the maximum registered rates: 2.5 lb ai/1000 ft^3 for 2 hours for cantaloupe, muskmelons, and watermelons; 2.5 lb ai/1000 ft^3 for 4 hours for cucumber; and 4 lb ai/1000 ft^3 for 2 hours in the case of pumpkins and summer and winter squash. The most commercially prevalent methods should be used (vacuum, boxcar, tarpaulin-covered stacks.), and multiple treatments should be made if $\geq$ 5 percent of the crop receives more than one treatment. Both MeBr per se and iBr should be sought in several trials for each crop. Aeration times should be added to labels. If crop group tolerances are sought, then the above data will be required only for the representative commodities cucumber, melons, and summer squash. In the case of muskmelons (and all representative commodities prior to approval of the preplant soil uses proposed in PP#5F3198), fruit must be grown in soil treated preplant in AZ, CA, and TX at 240 lb ai/A and then fumigated postharvest; iBr and MeBr per se should be sought before and after the postharvest fumigation.

19/ Sweet orange, lemons, and grapefruit must be planted in soil fumigated preplant at 870 lb ai/A (2 lb ai/tree site). Two years later (or as soon as ripe fruit first appear), fruit are to be harvested and fumigated postharvest at 3 lb ai/1000 ft^3 for 2 hours using the most prevalent methods (vacuum, boxcar, trailer, tarpaulin-covered stacks, etc.), used commercially. If multiple treatments occur commercially, these fruit should receive multiple treatments. MeBr per se and iBr should be determined before and after the postharvest fumigation. Oranges should be grown in AZ, CA, and FL, grapefruit in CA, FL, and TX, and lemons in AZ and CA. Aeration periods should be proposed. Calibration curves must be submitted to validate MeBr per se data generated using the method of King et al. Processed products (dried pulp, peel, oil, molasses, and juice) derived from RAC's bearing measurable weathered residues should be analyzed to determine if concentration occurs upon processing.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

20/ Apples, pears, and quinces must be grown in soil (in geographically representative areas) which has been fumigated preplant at 870 lb ai/A (2 lb ai/tree site). Two years after treatment (or as soon as ripe fruit can be obtained), fruit should be fumigated postharvest at 5 lb ai/1000 ft^3 for 2 hours using the predominant commercial procedures such as boxcar, vacuum, or tarpaulin-covered stacks. If multiple treatments occur commercially, these should be conducted. MeBr per se and iBr should be determined before and after the postharvest fumigation. Aeration periods should be proposed. Calibration curves must be submitted to validate data on MeBr per se generated using the King et al. method. Processed products derived from apples bearing measurable weathered residues must be analyzed to determine if concentration of residues occurs upon processing. [Note that if a crop group tolerance is proposed, data need be submitted for apples and pears only, since the registered uses on apples, pears, and quinces are identical.]

21/ Apricots, cherries, nectarines, peaches, and plums must be grown in geographically representative areas in soil fumigated preplant at 870 lb ai/A. Fruit should be harvested 2 years posttreatment (or as soon as ripe fruit are available) and then subjected to postharvest fumigation at 5 lb ai/1000 ft^3 for 2 hours. The most prevalent commercial fumigation methods (such as vacuum, boxcar, or tarpaulin) should be used. If multiple treatments are made to $\geq$ 5 percent of the crop, then these must be conducted. Both iBr and MeBr per se must be sought before and after the postharvest fumigation. Calibration curves must be submitted for each crop analyzed for MeBr per se using the method of King et al. Raw data (not mean values) must be submitted in every case. Aeration periods should be proposed. Fresh prunes bearing measurable weathered residues should be analyzed for both MeBr per se and iBr before and after drying to determine if residue concentration occurs. If group tolerances are sought, then only data cited above for cherries, peaches, and plums/prunes are required.

22/ Blueberries should be fumigated postharvest at 2 lb ai/1000 ft^3 for 4 hours. Grapes are to be grown in representative areas in soil fumigated preplant at 600 lb ai/A and the grapes, harvested as soon as possible from treated sites, and then fumigated postharvest at 4 lb ai/1000 ft^3 for 2 hours. Strawberries are to be grown in CA, FL, and OR in soil fumigated preplant at 240 lb ai/A; the berries, harvested as soon as possible from treated sites, are to be fumigated postharvest at 3 lb ai/1000 ft^3 for 4 hours. For all crops above, if multiple treatments are made commercially, then these must be conducted. Several commercially predominant methods must be tested such as vacuum, trailer, boxcar, and tarpaulin fumigation. MeBr per se and iBr should be sought after preplant treatment (if applicable) and after postharvest fumigation. Aeration periods should be proposed for postharvest uses. Calibration curves must be submitted to validate MeBr per se data generated using the King et al. method (1981). Grapes fumigated both preplant and postharvest and bearing measurable residues are to be processed into raisins, wet and dry pomace, raisin waste, and juice to determine if residue concentration occurs upon processing. If a crop group tolerance is sought, then data on a Rubus spp. (such as raspberries for which some data are available) and cranberry should be generated which reflect proposed uses.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

23/ Almonds, pecans, and English walnuts are to be grown in soil fumigated preplant at 870 lb ai/A and then fumigated postharvest at 3.5 lb ai/1000 ft^3 for 24 hours as soon as ripe nuts are available from treated plots or 2 years later, whichever is longer. Several fumigation methods should be tested (such as vacuum, boxcar, tarpaulin) if such methods are used commercially. If ≥ 5 percent of the nut crop are fumigated more than once, then the maximum number used commercially should be tested. MeBr per se and iBr should be determined before and after the postharvest fumigation(s). Sampling should be continued until MeBr per se is nondetectable (preferably approaching 0.001 ppm). This will allow establishment of an aeration period. Almond hulls must also be analyzed as above. If crop group tolerances are not sought, then data similar to that cited above must be submitted for Brazil nuts, butternuts, chestnuts, filberts, hickory nuts, and macadamia nuts.

24/ Fresh sweet corn should be fumigated postharvest at 3 lb ai/1000 ft^3 for 4 hours, field corn at 4 lb ai/1000 ft^3 for 12 hours, popcorn at 1.5 lb ai/1000 ft^3, rice and wheat at 6 lb ai/1000 ft^3 for 12 hours and 3 lb ai/1000 ft^3 for 24 hours, and sorghum at 6 lb ai/1000 ft^3 for 12 hours. Both iBr and MeBr per se must be sought. [For fresh sweet corn, kernels plus cobs with husks removed should be analyzed.] The most commercially important fumigation procedures must be tested such as vacuum, boxcar, silo, etc. If repeat applications are commercially typical, these are to be tested. Aeration should continue until MeBr per se is nondetectable (< 0.001 ppm, if possible) to allow the proposal of aeration intervals. The above studies should also be conducted for barley, oats, and rye if crop group tolerances are not to be sought. Processing studies should be conducted on field corn, rice, and wheat grain bearing measurable weathered residues of MeBr per se to determine if residues concentrate in processed products.

25/ Alfalfa hay is to be fumigated postharvest at 3 lb ai/1000 ft^3 for 24 hours using the most commercially prevalent methods (such as vacuum, tarpaulin, or trailer). If multiple treatments occur to ≥ 5 percent of the treated crop, then these must be reflected. Both iBr and MeBr per se must be sought. An aeration interval should be proposed. Alfalfa meal prepared from fumigated hay bearing measurable residues must also be analyzed to determine if residue concentration occurs.

26/ Basil, chives, dill, marjoram, and sage must be fumigated several times at 3 lb ai/1000 ft^3 (1X) for 24 hours to simulate fumigation in the exporting country, in transit (ship), at the port, and in storage in the United States. Several methods of fumigation must be tested if used commercially (ship hold, vacuum, tarpaulin, etc.). Both iBr and MeBr per se must be sought. Aeration periods should be proposed. Prior to approval of the preplant soil fumigation use (proposed in PP#5F3198), samples must be grown in treated soil and then multiply fumigated postharvest at the 1X rate for 24 hours.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

27/ Asparagus must be grown in CA in soil fumigated preplant at 400 lb ai/A and in MI and WA in soil treated at 240 lb ai/A. MeBr *per se* and iBr must be sought. Asparagus grown in fumigated soil must be fumigated postharvest at 4 lb ai/1000 ft^3 for 2 hours in a chamber at atmospheric pressure prior to residue analysis. An aeration interval following postharvest fumigation should be proposed.

28/ Avocados must be fumigated postharvest at 2 lb ai/1000 ft^3 for 4 hours in a chamber (and any other method used commercially in CA) at atmospheric pressure. Both iBr and MeBr *per se* must be determined. Aeration must be continued until MeBr *per se* dissipates to below detectable levels (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed.

29/ Cocoa beans (unroasted) must be fumigated postharvest at 1.5 lb ai/1000 ft^3 for 12 hours in a chamber. Both iBr and MeBr *per se* must be determined. Aeration must be continued until MeBr *per se* is nondetectable (< 0.01 to <0.001 ppm) and an aeration interval should be proposed. If multiple fumigations are practiced commercially, these must also be conducted. Residues must be determined in roasted beans, cocoa powder, and chocolate processed from fumigated cocoa beans bearing measurable residues.

30/ Green coffee beans and/or roasted beans (as per commercial practice) are to be fumigated postharvest at 2.5 lb ai/1000 ft^3 for 24 hours using various fumigation techniques such as vacuum chamber, ship hold, or tarpaulin (whichever are commercially predominant). If multiple fumigations are practiced commercially, then data should reflect such treatment. MeBr *per se* and iBr must be sought. It must be specified whether green or roasted beans are treated. The dosage and exposure time for the MB *per se* study (PP#5F3300) must be specified. A calibration curve should be submitted to validate data on MeBr *per se* generated using the King et al. method. Residues must be determined in roasted beans and instant coffee processed from fumigated green beans bearing measurable residues. If roasted beans are fumigated, then residues must be determined in roasted beans and in instant coffee processed from roasted beans bearing measurable residues resulting from this use.

31/ Copra is to be fumigated repeatedly (as per commercial custom) at 2.5 lb ai/1000 ft^3 for 24 hours using the prevalent commercial techniques (vacuum chamber, ship hold, tarpaulin, etc.). Both iBr and MeBr *per se* are to be sought. Aeration must continue until MeBr *per se* is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed.

32/ Cottonseed are to be fumigated repeatedly (as per commercial custom) in a chamber at normal pressure at 9 lb ai/1000 ft^3 for 12 hours and at 4 lb ai/1000 ft^3 for 24 hours, under a tarpaulin at 9 lb ai/1000 ft^3 for 12 hours, and 6 lb ai/1000 ft^3 for 24 hours and under 660 mmHg vacuum at 9 lb ai/1000 ft^3 for 3 hours. Both iBr and MeBr *per se* are to be determined. Aeration must continue until MeBr *per se* is nondetectable (<0.01 to < 0.001 ppm) and an aeration interval should be proposed. Residues are to be determined in meal, hulls, soapstock, crude oil, and refined oil prepared from fumigated cottonseed bearing measurable residues to determine whether concentration occurs upon processing.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.125 Residue Chemistry - Continued

33/ Okra is to be fumigated (repeatedly, if this is a common practice) postharvest at 3.5 lb ai/1000 ft^3 for 2 hours in a chamber at normal atmospheric pressure. Both iBr and MeBr *per se* are to be determined. Aeration should preferably continue until MeBr *per se* is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed. Prior to approval of the proposed preplant soil fumigation use (PP#5F3198), data reflecting both preplant and postharvest fumigation of the same samples will be required.

34/ Peanuts are to be fumigated postharvest (repeatedly, if this is the commercial practice) at 3.5 lb ai/1000 ft^3 for 24 hours. The most prevalent fumigation methods should be tested (vacuum, boxcar, tarpaulin, etc.). Both iBr and MeBr *per se* should be sought. Aeration should preferably continue until MeBr *per se* is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed. Residues should be determined in meal, soapstock, crude oil, and refined oil processed from fumigated peanuts bearing measurable residues to determine whether concentration occurs upon processing.

35/ Pineapples are to be grown in representative areas in soil fumigated preplant at 240 lb ai/A. As soon as harvestable fruit are available, they should be fumigated postharvest at 2 lb ai/1000 ft^3 for 6 hours using the most prevalent methods (ship hold, vacuum, tarpaulin, etc.). If multiple treatments are typical, they should be conducted. MeBr *per se* and iBr should be determined before and after the postharvest fumigation. Aeration should preferably continue until MeBr *per se* is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed. Residues in pineapple bran and juice processed from pineapple bearing measurable weathered residues should also be determined to discover if concentration of residues occurs.

36/ Pistachio nuts are to be fumigated postharvest (repeatedly, if commercially conducted) at 3.5 lb ai/1000 ft^3 for 24 hours. The prevalent fumigation techniques should be tested such as vacuum, ship hold, boxcar, etc. Both iBr and MeBr *per se* should be sought. Aeration must continue until MeBr *per se* is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed. The methods of analysis must be identified for existing studies. If the King et al. method is used, a calibration curve must be submitted.

§158.125 Residue Chemistry - Continued

37/ Tobacco should be grown in NC (38.3% of domestic production) and KY (22.7%) in soil fumigated preplant at 872 lb ai/A. According to commercial procedures, the tobacco above should be harvested and fumigated postharvest in a chamber (atmospheric pressure) at 3 lb ai/1000 ft^3 for 72 hours, in a warehouse at 4.5 lb ai/1000 ft^3 for 24 hours, and in a vacuum chamber (at about 675 mmHg) at 4 lb ai/1000 ft^3 for 4 hours. If leaves are fumigated both green and cured, then both must be tested. If tobacco is fumigated both hanging and baled, both are to be tested. MeBr per se and iBr must be sought both before and after the postharvest fumigation. Aeration must continue until MeBr per se is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed. If MeBr per se is detectable in or on dried or cured tobacco, pyrolysis products must be characterized and quantified in smoke. If several postharvest treatments occur to the same leaves commercially (regardless of method), then these must be represented. The test parameters (rate, exposure time, pressure, temperature, etc.), should be submitted as should calibration curves if the method of King et al. is used.

38/ Chocolate candy, cheese, meats, dried eggs, corn meal, rolled oats, flours, several dried fruits, and several other representative miscellaneous processed products are to be fumigated in storage at 2 lb ai/1000 ft^3 for 24 hours (1.5 lb ai/1000 ft^3 for 24 hours in the case of dried fruits). If multiple fumigations of all or some of these items occurs, then the data should reflect this. Several fumigation techniques (ship hold, vacuum and atmospheric chamber, boxcar, tarpaulin) should be tested. Both MeBr per se and iBr should be determined. Aeration must continue until MeBr per se is nondetectable (< 0.01 to < 0.001 ppm) and an aeration interval should be proposed. Dosage and exposure duration used in the studies of MeBr per se submitted with PP#5F3300 must be provided as must calibration curves for all foods analyzed using the method of King et al.

39/ No conclusions can be reached at this time as to the magnitude of residues of MeBr per se or iBr in animal products because the magnitude of residues in feed items, metabolism in plants, and (if required) metabolism in animals are not adequately defined. Upon receipt of these data, the necessity/magnitude of tolerances for MeBr per se and iBr in animal products will be determined.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.130 Environmental Fate						
DEGRADATION STUDIES-LAB:						
161-1 - Hydrolysis	TGAI or PAIRA	A,B,E,F	Yes	00147718	No	
Photodegradation						
161-2 - In Water	TGAI or PAIRA	A,B	No		Yes	9 Months
161-3 - On Soil	TGAI or PAIRA	N/A	No		No1/	
161-4 - In Air	TGAI or PAIRA	A,B,E,F	No		No2/	
METABOLISM STUDIES-LAB:						
162-1 - Aerobic Soil	TGAI or PAIRA	A,B,E,F	No		Yes3/	
162-2 - Anaerobic Soil	TGAI or PAIRA	A,B	No		Yes3/	
162-3 - Anaerobic Aquatic	TGAI or PAIRA	N/A	No		No4/	
162-4 - Aerobic Aquatic	TGAI or PAIRA	N/A	No		No4/	
MOBILITY STUDIES:						
163-1 - Leaching and Adsorption/Desorption	TGAI or PAIRA	N/A	No		Yes3/	
163-2 - Volatility (Lab)	TEP	N/A	No		No2/	
163-3 - Volatility (Field)	TEP	N/A	No		No2/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.130 Environmental Fate - Continued						
DISSIPATION STUDIES-FIELD:						
164-1 - Soil	TEP	A,B,E,F	No		Yes3/	
164-2 - Aquatic (Sediment)	TEP	N/A	No		No4/	
164-3 - Forestry	TEP	N/A	No		No5/	
164-4 - Combination and Tank Mixes	TEP	N/A	No		No6/	
164-5 - Soil, Long-Term	TEP	A,B	No		Reserved7/	
ACCUMULATION STUDIES:						
165-1 - Rotational Crops (Confined)	PAIRA	A,B,E,F	No		Reserved8/	
165-2 - Rotational Crops (Field)	TEP	A,B	No		Reserved9/	
165-3 - Irrigated Crops	TEP	N/A	No		No2/	
165-4 - In Fish	TGAI or PAIRA	A,B	No		No10/	
165-5 - In Aquatic Non-Target Organisms	TEP	A,B	No		No10/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.130 Environmental Fate - Continued

1/ Not required because the product will not remain on the soil surface where it will be subjected to light.
2/ Not required because this product is intended to volatize.
3/ These data have been received by the Agency and are currently under review.
4/ Not required because there are no aquatic or aquatic impact uses.
5/ Not required because there are no forestry uses.
6/ Not required because of the nature of the registered use patterns for methyl bromide.
7/ May be required unless soil residues have dissipated below 50% of the initial treatment prior to subsequent treatment.
8/ Development of this data is contingent upon the results of the data submitted to support residues in target crops.
9/ Development of this data is contingent upon the results of the confined accumulation studies.
10/ Not required because the octanol/water partition coefficient is 15.5:1.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Date Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted	Time Frame for Submission
§158.135 Toxicology						
ACUTE TESTING:						
81-1 - Acute Oral Toxicity - Rat	TGAI	A,B,E,F,I	Yes	00159664	No	
81-2 - Acute Dermal Toxicity - Rabbit	TGAI	A,B,E,F,I	Yes	00159664	No	
81-3 - Acute Inhalation Toxicity - Rat	TGAI	A,B,E,F,I	Yes	00159664	No	
81-7 - Delayed Neurotoxicity - Hen	TGAI	N/A	No		No1/	
SUBCHRONIC TESTING:						
82-1 - 90-Day Feeding:	TGAI	A,B,E,F,I	No			
- Rodent, and					No2/	
- Non-Rodent (Dog)					No2/	
82-2 - 21-Day Dermal - Rabbit	TGAI	N/A	No		No3/	
82-3 - 90-Day Dermal - Rabbit	TGAI	N/A	No		No3/	
82-4 - 90-Day Inhalation:	TGAI	A,B,E,F,I	No			
- Rat, and					Yes4/	15 Months
- Rabbit					Yes4/5/	15 Months
82-5 - 90-Day Neurotoxicity: - Hen	TGAI	A,B,E,F,I	No		No1/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.135 Toxicology - Continued						
CHRONIC TESTING:						
83-1 - Chronic Toxicity - 2 Species:	TGAI	A,B,E,F,I				
- Rodent (Rat), and			No		Yes6/	50 Months
- Non-rodent (Dog)			No		Yes6/	50 Months
83-2 - Oncogenicity - 2 Species:	TGAI	A,B,E,F,I	No			
- Rat (preferred), and			No		Yes6/7/	
- Mouse (preferred)			No		Yes6/7/	
83-3 - Teratogenicity - 2 Species:	TGAI	A,B,E,F,I				
- Rat			Yes	00102990	No	
- Rabbit			No		Yes	15 Months
83-4 - Reproduction - Rat 2-Generation	TGAI	A,B,E,F,I	No		Yes6/8/	39 Months
MUTAGENICITY TESTING						
84-2 - Gene Mutation (Ames Test)	TGAI	A,B,E,F,I	Yes	00159662	No	
84-2 - Structural Chromosomal Aberration	TGAI	A,B,E,F,I	No		Yes9/	12 Months
84-4 - Other Genotoxic Effects	TGAI	A,B,E,F,I	No		Yes10/	12 Months

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.135 Toxicology - Continued						
SPECIAL TESTING						
85-1 - General Metabolism	PAI or PAIRA	A,B,E,F,I	Partially	00159964	Reserved11/	
85-2 - Dermal Penetration	Choice	N/A	No		No3/	
86-1 - Domestic Animal Safety	Choice	N/A	No		No12/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.135 Toxicology - Continued

1/ This chemical is not an organophosphorous compound nor does it produce cholinesterase inhibition.

2/ 90-day range finding studies should be carried out to determine dosage and target organs prior to chronic studies.

3/ Not required because there is no expected dermal exposure from the registered patterns of use.

4/ Neurological effects should be emphasized in carrying out methyl bromide studies by any route of exposure or duration.

5/ Testing in the rabbit is required because this species appears to be very sensitive to the effects of methyl bromide.

6/ Because tolerances are required, this study should be conducted by gavage.

7/ These data are being developed to satisfy the requirements of a Data Call In Notice dated July 2, 1981 for methyl bromide. As required by that notice, the data must be submitted by January 31, 1987.

8/ An inhalation reproductive study has been received by the Agency and is currently under review.

9/ Bone marrow and sister chromatid exchange tests using appropriate dose levels are required.

10/ Unscheduled DNA synthesis using rat hepatocytes and a test to determine the effects on germ cells are required.

11/ If toxicology and residue data indicate residues of toxicological significance, these studies will be required.

12/ Based on the registered patterns of use, there is no expected exposure to domestic animals.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.140 Reentry Protection						
132-1 Foliar Dissipation	TEP	N/A	No		No1/	
132-1 - Soil Dissipation	TEP	A,B	No		Yes	27 Months
133-3 - Dermal Exposure	TEP	N/A	No		No2/	
133-4 - Inhalation Exposure	TEP	A,B,E,F,I	Partially	00159648,00159649 00159651,00159652 00159653,00159654 00159655,00159656 00159657,00159658 00159659,00159660 00159661	Yes3/	

: :

1/ Not required because there are no foliar uses.
2/ Not required because there is no expected dermal exposure from the use of methyl bromide.
3/ These data have been received by the Agency and are currently under review.

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.145 Wildlife and Aquatic Organisms						
AVIAN AND MAMMALIAN TESTING						
71-1 - Acute Avian Oral Toxicity	TGAI	N/A	No		No1/	
71-2 - Avian Subacute Dietary Toxicity	TGAI	N/A	No			
- Upland Game Bird, and					No1/	
- Waterfowl					No1/	
71-3 - Wild Mammal Toxicity	TGAI	N/A	No		No2/	
71-4 - Avian Reproduction	TGAI	N/A	No			
- Upland Game Bird, and					No2/	
- Waterfowl					No2/	
71-5 - Simulated Field Testing	TEP	N/A	No			
- Mammals, and					No2/	
- Birds					No2/	
- Actual Field Testing	TEP	N/A	No			
- Mammals, and					No2/	
- Birds					No2/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.145 Wildlife and Aquatic Organisms - Continued						
AQUATIC ORGANISM TESTING						
72-1 - Freshwater Fish Toxicity	TGAI	A,B	No			
- Coldwater Fish Species, and					No2/	
- Warmwater Fish Species					Reserved3/4/	
72-2 - Acute Toxicity to Freshwater Invertebrates	TGAI	A,B	No		Reserved3/	
72-3 - Acute Toxicity to Estuarine and Marine Organisms	TGAI	N/A	No			
- Fish					No2/	
- Mollusk					No2/	
- Shrimp					No2/	
72-4 - Fish Early Life Stage, and	TGAI	N/A	No		No2/	
- Aquatic Invertebrate Life-Cycle					No2/	
72-5 - Fish - Life-Cycle	TGAI	N/A	No		No2/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.145 Wildlife and Aquatic Organisms - Continued						
72-6 - Aquatic Organism Accumulation	TGAI, PAI OR Degradation Product	N/A	No			
- Crustacean					No2/	
- Fish					No2/	
- Insect Nymph					No2/	
- Mollusk					No2/	
72-7 - Simulated Field Testing - Aquatic Organisms	TEP	N/A	No		No2/	
- Actual Field Testing - Aquatic Organisms					No2/	

TABLE A
GENERIC DATA REQUIREMENTS FOR METHYL BROMIDE

§158.145 Wildlife and Aquatic Organisms - Continued

1/ Not required because the product is a gas at room temperature.
2/ Not required because there is no expected exposure from the registered patterns of use.
3/ Based on the registered patterns of use, surface contamination from the use of methyl bromide is unlikely. Development of this data is therefore contingent upon a determination of whether or not groundwater contamination from the outdoor uses of methyl bromide is established.
4/ Bluegill sunfish should be used. A warm water species was selected because methyl bromide is used mainly in areas with warm waters.

TABLE B
PRODUCT SPECIFIC DATA REQUIREMENTS FOR MANUFACTURING-USE PRODUCTS CONTAINING METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation1/	Must Additional Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry						
Product Identity:						
61-1 - Product Identity and Disclosure of Ingredients	MP	All		N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	MP	All		N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	MP	All		N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis	MP	All		N/A	Yes	12 Months
62-2 - Certification of Limits	MP	All		N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limit	MP	All		N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	MP	All		N/A	Yes	6 Months
63-3 - Physical State	MP	All		N/A	Yes	6 Months
63-4 - Odor	MP	All		N/A	Yes	6 Months

TABLE B

PRODUCT SPECIFIC DATA REQUIREMENTS FOR MANUFACTURING-USE PRODUCTS CONTAINING METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation1/	Must Additional Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
Physical and Chemical Characteristics (Continued)						
63-7 - Density, Bulk Density, or Specific Gravity	MP	All		N/A	Yes	6 Months
63-12 - pH	MP	All		N/A	Yes	6 Months
63-14 - Oxidizing or Reducing Action	MP	All		N/A	Yes	6 Months
63-15 - Flammability	MP	All		N/A	No2/	
63-16 - Explodability	MP	All		N/A	Yes	6 Months
63-17 - Storage Stability	MP	All		N/A	Yes	15 Months
63-18 - Viscosity	MP	All		N/A	No3/	
63-19 - Miscibility	MP	All		N/A	No3/	
63-20 - Corrosion Characteristics	MP	All		N/A	Yes	6 Months

1/ Not applicable. Although product chemistry data may have been submitted in the past, the Agency has determined that these data must be resubmitted for each manufacturing use product. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ Not required because the product does not contain combustible liquids under atmospheric conditions.

3/ Not required because the product is a gas at room temperature.

TABLE B
PRODUCT SPECIFIC DATA REQUIREMENTS FOR MANUFACTURING-USE PRODUCTS CONTAINING METHYL BROMIDE

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Additional Data be Submitted?	Time Frame for Submission
§158.135 Toxicology						
ACUTE TESTING						
81-1 - Acute Oral Toxicity - Rat	MP	A,B,E,F,I	Yes	00159664	No	
81-2 - Acute Dermal Toxicity - Rabbit	MP	A,B,E,F,I	Yes	00159664	No	
81-3 - Acute Inhalation Toxicity - Rat	MP	A,B,E,F,I	Yes	00159664	No	
81-4 - Primary Eye Irritation - Rabbit	MP	A,B,E,F,I	Yes	00159664	No	
81-5 - Primary Dermal Irritation - Rabbit	MP	A,B,E,F,I	Yes	00159664	No	
81-6 - Dermal Sensitization - Guinea Pig	MP	A,B,E,F,I	Yes	00159664	No	

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LABEL CONTENTS

40 CFR 162.10 requires that certain specific labeling statements appear at certain locations on the label. This is referred to as format labeling. Specific label items listed below are keyed to the table at the end of this Appendix.

Item 1. PRODUCT NAME - The name, brand or trademark is required to be located on the front panel, preferably centered in the upper part of the panel. The name of a product will not be accepted if it is false or misleading.

Item 2. COMPANY NAME AND ADDRESS - The name and address of the registrant or distributor is required on the label. The name and address should preferably be located at the bottom of the front panel or at the end of the label text.

Item 3. NET CONTENTS - A net contents statement is required on all labels or on the container of the pesticide. The preferred location is the bottom of the front panel immediately above the company name and address, or at the end of the label text. The net contents must be expressed in the largest suitable unit, e.g., "1 pound 10 ounces" rather than "26 ounces." In addition to English units, net contents may be expressed in metric units. [40 CFR 162.10(d)]

Item 4. EPA REGISTRATION NUMBER - The registration number assigned to the pesticide product must appear on the label, preceded by the phrase "EPA Registration No.," or "EPA Reg. No." The registration number must be set in type of a size and style similar to other print on that part of the label on which it appears and must run parallel to it. The registration number and the required identifying phrase must not appear in such a manner as to suggest or imply recommendation or endorsement of the product by the Agency.
[40 CFR 162.10(e)]

Item 5. EPA ESTABLISHMENT NUMBER - The EPA establishment number, preceded by the phrase "EPA Est." is the final establishment at which the product was produced, and may appear in any suitable location on the label or immediate container. It must also appear on the wrapper or outside container of the package if the EPA establishment number on the immediate container cannot be clearly read through such wrapper or container.
[40 CFR 162.10(f)]

Item 6A. INGREDIENTS STATEMENT - An ingredients statement is required on the front panel. The ingredients statement must contain the name and percentage by weight of each active ingredient and the total percentage by weight of all inert ingredients. The preferred location is immediately below the product name. The ingredients statement must run parallel with, and be clearly distinguished from, other text on the panel. It must not be placed in the body of other text. [40 CFR 162.10(g)]

Item 6B. POUNDS PER GALLON STATEMENT - For liquid agricultural formulations, the pounds per gallon of active ingredient must be indicated on the label.

Item 7. FRONT LABEL PRECAUTIONARY STATEMENTS - Front panel precautionary statements must be grouped together, preferably within a block outline. The table below shows the minimum type size requirements for various size labels.

Size of Label on Front Panel in Square Inches	Signal Word Minimum Type Size All Capitals	"Keep Out of Reach of Children" Minimum Type Size
5 and under	6 point	6 point
above 5 to 10	10 point	6 point
above 10 to 15	12 point	8 point
above 15 to 30	14 point	10 point
over 30	18 point	12 point

Item 7A. CHILD HAZARD WARNING STATEMENT - The statement "Keep Out of Reach of Children" must be located on the front panel above the signal word except where contact with children during distribution or use is unlikely. [40 CFR 162.10(h)(1)(ii)]

Item 7B. SIGNAL WORD - The signal word (DANGER, WARNING, or CAUTION) is required on the front panel immediately below the child hazard warning statement. [40 CFR 162.10 (h)(1)(i)]

Item 7C. SKULL & CROSSBONES AND WORD "POISON" - On products assigned a toxicity Category I on the basis of oral, dermal, or inhalation toxicity, the word "Poison" shall appear on the label in red on a background of distinctly contrasting color and the skull and crossbones shall appear in immediate proximity to the word POISON. [40 CFR 162.10(h)(1)(i)]

Item 7D. STATEMENT OF PRACTICAL TREATMENT - A statement of practical treatment (first aid or other) shall appear on the label of pesticide products in toxicity Categories I, II, and III. [40 CFR 162.10(h)(1)(iii)]

Item 7E. REFERRAL STATEMENT - The statement "See Side (or Back) Panel for Additional Precautionary Statements" is required on the front panel for all products, unless all required precautionary statements appear on the front panel. [40 CFR 162.10(h)(1)(iii)]

Item 8. SIDE/BACK PANEL PRECAUTIONARY LABELING - The precautionary statements listed below must appear together on the label under the heading "PRECAUTIONARY STATEMENTS." The preferred location is at the top of the side or back panel preceding the directions for use, and it is preferred that these statements be surrounded by a block outline. Each of the three hazard warning statements must be headed by the appropriate hazard title. [40 CFR 162.10(h)(2)].

Item 8A. HAZARD TO HUMANS AND DOMESTIC ANIMALS - Where a hazard exists to humans or domestic animals, precautionary statements are required indicating the particular hazard, the route(s) of exposure and the precautions to be taken to avoid accident, injury or damage. [40 CFR 162.10(h)(2)(i)]

Item 8B. ENVIRONMENTAL HAZARD - Where a hazard exists to non-target organisms excluding humans and domestic animals, precautionary statements are required stating the nature of the hazard and the appropriate precautions to avoid potential accident, injury, or damage. [40 CFR 162.10(h)(2)(ii)]

Item 8C. PHYSICAL OR CHEMICAL HAZARD - FLAMMABILITY Precautionary statements relating to flammability of a product are required to appear on the label if it meets the criteria in the PHYS/CHEM Labeling Appendix. The requirement is based on the results of the flashpoint determinations and flame extension tests required to be submitted for all products. These statements are to be located in the side/back panel precautionary statements section, preceded by the heading "Physical/Chemical Hazards." Note that no signal word is used in conjunction with the flammability statements.

Item 9A. RESTRICTED USE CLASSIFICATION - FIFRA sec. 3(d) requires that all pesticide formulations/uses be classified for either general or restricted use. Products classified for restricted use may be limited to use by certified applicators or persons under their direct supervision (or may be subject to other restrictions that may be imposed by regulation).

In the Registration Standard, the Agency has (1) indicated certain formulations/uses are to be restricted (Section IV indicates why the product has been classified for restricted use); or (2) reserved any classification decision until appropriate data are submitted.

The Regulatory Position and Rationale states whether products containing this active ingredient are classified for restricted use. If they are restricted the draft label(s) submitted to the Agency as part of your application must reflect this determination (see below).

If you do not believe that your product should be classified for restricted use, you must submit any information and rationale with your application for reregistration. During the Agency's review of your application, your proposed classification determination will be evaluated in accordance with the provisions of 40 CFR 162.11(c). You will be notified of the Agency's classification decision.

Classification Labeling Requirements

If your product has been classified for restricted use, the following label requirements apply:

1. All uses restricted.

a. The statement "Restricted Use Pesticide" must appear at the top of the front panel of the label. The statement must be set in type of the same minimum size as required for human hazard signal word (see table in 40 CFR 162.10(h)(1)(iv)

b. Directly below this statement on the front panel, a summary statement of the terms of restriction must appear (including the reasons for restriction if specified in Section I). If use is restricted to certified applicators, the following statement is required: "For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification."

2. Some but not all uses restricted. If the Regulatory Position and Rationale states that some uses are classified for restricted use, and some are unclassified, several courses of action are available:

a. You may label the product for Restricted use. If you do so, you may include on the label uses that are unrestricted, but you may not distinguish them on the label as being unrestricted.

b. You may delete all restricted uses from your label and submit draft labeling bearing only unrestricted uses.

c. You may "split" your registration, i.e., register two separate products with identical formulations, one bearing only unrestricted uses, and the other bearing restricted uses. To do so, submit two applications for reregistration, each containing all forms and necessary labels. Both applications should be submitted simultaneously. Note that the products will be assigned separate registration numbers.

Item 9B. MISUSE STATEMENT - All products must bear the misuse statement, "It is a violation of Federal law to use this product in a manner inconsistent with its labeling." This statement appears at the beginning of the directions for use, directly beneath the heading of that section.

Item 10A. REENTRY STATEMENT - If a reentry interval has been established by the Agency, it must be included on the label. Additional worker protection statements may be required in accordance with PR Notice 83-2, March 29, 1983.

Item 10B. STORAGE AND DISPOSAL BLOCK - All labels are required to bear storage and disposal statements. These statements are developed for specific containers, sizes, and chemical content. These instructions must be grouped and appear under the heading "Storage and Disposal" in the directions for use. This heading must be set in the same type sizes as required for the child hazard warning. Refer to Appendix II, STOR, PEST/DIS, and CONT/DIS to determine the storage and disposal instructions appropriate for your products.

Item 10C. DIRECTIONS FOR USE - Directions for use must be stated in terms which can be easily read and understood by the average person likely to use or to supervise the use of the pesticide. When followed, directions must be adequate to protect the public from fraud and from personal injury and to prevent unreasonable adverse effects on the environment. [40 CFR 162.10]

COLLATERAL LABELING

Bulletins, leaflets, circulars, brochures, data sheets, flyers, or other written or graphic printed matter which is referred to on the label or which is to accompany the product are termed collateral labeling. Such labeling may not bear claims or representations that differ in substance from those accepted in connection with registration of the product. It should be made part of the response to this notice and submitted for review.

LABELING REQUIREMENTS OF THE FIFRA, AS AMENDED

ITEM	LABEL ELEMENT	APPLICABILITY OF REQUIREMENT	PLACEMENT ON LABEL		COMMENTS
			REQUIRED	PREFERRED	
1	Product name	All products	Front panel	Center front panel	
2	Company name and address	All products	None	Bottom front panel or end of label text	If registrant is not the producer, must be qualified by "Packed for . . .," "Distributed by. . .," etc.
3	Net contents	All products	None	Bottom front panel or end of label text	May be in metric units in addition to U.S. units
4	EPA Reg. No.	All products	None	Front panel	Must be in similar type size and run parallel to other type.
5	EPA Est. No.	All products	None	Front panel, immediately before or following Reg. No.	May appear on the container instead of the label.
6A	Ingredients statement	All products	Front panel	Immediately following product name	Text must run parallel with other text on the panel.
6B	Pounds/gallon statement	Liquid products where dosage given as lbs. ai/unit area	Front panel	Directly below the main ingredients statement	
7	Front panel precautionary statements	All products	Front panel		All front panel precautionary statements must be grouped together, preferably blocked.
7A	Keep Out of Reach of Children (Child hazard warning)	All products	Front panel	Above signal word	Note type size requirements.
7B	Signal word	All products	Front panel	Immediately below child hazard warning	Note type size requirements.

ITEM	LABEL ELEMENT	APPLICABILITY OF REQUIREMENT	PLACEMENT ON LABEL		COMMENTS
			REQUIRED	PREFERRED	
7C	Skull & crossbones and word POISON (in red)	All products which are Category I based on oral, dermal, or inhalation toxicity	Front panel	Both in close proximity to signal word	
7D	Statement of Practical Treatment or First Aid	All products in Categories I, II, and III	Category I: Front panel unless referral statement is used. Others: Grouped with side panel precautionary statements.	Front panel for all.	
7E	Referral statement	All products where precautionary labeling appears on other than front panel.	Front panel		
8	Side/back panel precautionary statements	All products	None	Top or side of back panel preceding directions for use	Must be grouped under the headings in 8A, 8B, and 8C; preferably blocked.
8A	Hazards to humans and domestic animals	All products in Categories I, II, and III	None	Same as above	Must be preceded by appropriate signal word.
8B	Environmental hazards	All products	None	Same as above	Environmental hazards include bee caution where applicable.

ITEM	LABEL ELEMENT	APPLICABILITY OF REQUIREMENT	PLACEMENT ON LABEL		COMMENTS
			REQUIRED	PREFERRED	
8C	Physical or chemical hazards	All pressurized products, others with flash points under 150°F	None	Same as above	Refer to Appendix II guide PHYS/CHEM
9A	Restricted block	All restricted products	Top center of front panel	Preferably blocked	Includes a statement of the terms of restriction. The words "RESTRICTED USE PESTICIDE" must be same type size as signal word.
9B	Misuse statement	All products	Immediately following heading of directions for use		Required statement is: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling."
10A	Reentry statement	PR Notice 83-2 or as determined by the Agency	In the directions for use	Immediately after misuse statement	
10B	Storage and disposal block	All products	In the directions for use	Immediately before specific directions for use or at the end of directions for use	Must be set apart and clearly distinguishable from from other directions for use. Refer to Appendix II guides STOR, CONT/DIS, and PEST/DIS for further information and required statements.
10C	Directions for use	All products	None	None	May be in metric as well as U.S. units

§ 162.10 Labeling requirements.

(a) *General*—(1) *Contents of the label.* Every pesticide products shall bear a label containing the information specified by the Act and the regulations in this Part. The contents of a label must show clearly and prominently the following:

(i) The name, brand, or trademark under which the product is sold as prescribed in paragraph (b) of this section;

(ii) The name and address of the producer, registrant, or person for whom produced as prescribed in paragraph (c) of this section;

(iii) The net contents as prescribed in paragraph (d) of this section;

(iv) The product registration number as prescribed in paragraph (e) of this section;

(v) The producing establishment number as prescribed in paragraph (f) of this section;

(vi) An ingredient statement as prescribed in paragraph (g) of this section;

(vii) Warning or precautionary statements as prescribed in paragraph (h) of this section;

(viii) The directions for use as prescribed in paragraph (i) of this section; and

(ix) The use classification(s) as prescribed in paragraph (j) of this section.

(2) *Prominence and legibility.* (i) All words, statements, graphic representations, designs or other information required on the labeling by the Act or the regulations in this part must be clearly legible to a person with normal vision, and must be placed with such conspicuousness (as compared with other words, statements, designs, or graphic matter on the labeling) and expressed in such terms as to render it likely to be read and understood by the ordinary individual under customary conditions of purchase and use.

(ii) All required label text must:

(A) Be set in 6-point or larger type;

(B) Appear on a clear contrasting background; and

(C) Not be obscured or crowded.

(3) *Language to be used.* All required label or labeling text shall appear in the English language. However, the Agency may require or the applicant may propose additional text in other languages as is considered necessary to protect the public. When additional text in another language is necessary, all labeling requirements will be applied equally to both the English and other-language versions of the labeling.

(4) *Placement of Label*—(i) *General.* The label shall appear on or be securely attached to the immediate container of the pesticide product. For purposes of this Section, and the misbranding provisions of the Act, "securely attached" shall mean that a label can reasonably be expected to remain affixed during the foreseeable conditions and period of use. If the immediate container is enclosed within a wrapper or outside container through which the label cannot be clearly read, the label must also be securely attached to such outside wrapper or container, if it is a part of the package as customarily distributed or sold.

(ii) *Tank cars and other bulk containers*—(A) *Transportation.* While a pesticide product is in transit, the appropriate provisions of 49 CFR Parts 170–189, concerning the transportation of hazardous materials, and specifically those provisions concerning the labeling, marking and placarding of hazardous materials and the vehicles carrying them, define the basic Federal requirements. In addition, when any registered pesticide product is transported in a tank car, tank truck or other mobile or portable bulk container, a copy of the accepted label must be attached to the shipping papers, and left with the consignee at the time of delivery.

(B) *Storage.* When pesticide products are stored in bulk containers, whether mobile or stationary, which remain in the custody of the user, a copy of the label of labeling, including all appropriate directions for use, shall be securely attached to the container in the immediate vicinity of the discharge control valve.

(5) *False or misleading statements.* Pursuant to section 2(qX1XA) of the Act, a pesticide or a device declared subject to the Act pursuant to § 162.15, is misbranded if its labeling is false or misleading in any particular including both pesticidal and non-pesticidal claims. Examples of statements or representations in the labeling which constitute misbranding include:

(i) A false or misleading statement concerning the composition of the product;

(ii) A false or misleading statement concerning the effectiveness of the product as a pesticide or device;

(iii) A false or misleading statement about the value of the product for purposes other than as a pesticide or device;

(iv) A false or misleading comparison with other pesticides or devices;

(v) Any statement directly or indirectly implying that the pesticide or device is recommended or endorsed by any agency of the Federal Government;

(vi) The name of a pesticide which contains two or more principal active ingredients if the name suggests one or more but not all such principal active ingredients even though the names of the other ingredients are stated elsewhere in the labeling;

(vii) A true statement used in such a way as to give a false or misleading impression to the purchaser;

(viii) Label disclaimers which negate or detract from labeling statements required under the Act and these regulations;

(ix) Claims as to the safety of the pesticide or its ingredients, including statements such as "safe," "nonpoisonous," "noninjurious," "harmless" or "nontoxic to humans and pets" with or without such a qualifying phrase as "when used as directed"; and

(x) Non-numerical and/or comparative statements on the safety of the product, including but not limited to:

(A) "Contains all natural ingredients";

(B) "Among the least toxic chemicals known"

(C) "Pollution approved"

(6) *Final printed labeling.* (i) Except as provided in paragraph (a)(6)(ii) of this section, final printed labeling must be submitted and accepted prior to registration. However, final printed labeling need not be submitted until draft label texts have been provisionally accepted by the Agency.

(ii) Clearly legible reproductions or photo reductions will be accepted for unusual labels such as those silk-screened directly onto glass or metal containers or large bag or drum labels. Such reproductions must be of microfilm reproduction quality.

(b) *Name, brand, or trademark.* (1) The name, brand, or trademark under which the pesticide product is sold shall appear on the front panel of the label.

(2) No name, brand, or trademark may appear on the label which:

(i) Is false or misleading, or

(ii) Has not been approved by the Administrator through registration or supplemental registration as an additional name pursuant to § 162.6(b)(4)

(c) Name and address of producer, registrant, or person for whom produced. An unqualified name and address given on the label shall be considered as the name and address of the producer. If the registrant's name appears on the label and the registrant is not the producer, or if the name of the person for whom the pesticide was produced appears on the label, it must be qualified by appropriate wording such as "Packed for * * *," "Distributed by * * *," or "Sold by * * *" to show that the name is not that of the producer.

(d) *Net weight or measure of contents.* (1) The net weight or measure of content shall be exclusive of wrappers or other materials and shall be the average content unless explicitly stated as a minimum quantity.

(2) If the pesticide is a liquid, the net content statement shall be in terms of liquid measure at 68° F (20°C) and shall be expressed in conventional American units of fluid ounces, pints, quarts, and gallons.

(3) If the pesticide is solid or semisolid, viscous or pressurized, or is a mixture of liquid and solid, the net content statement shall be in terms of weight expressed as avoirdupois pounds and ounces.

(4) In all cases, net content shall be stated in terms of the largest suitable units, i.e., "1 pound 10 ounces" rather than "26 ounces."

(5) In addition to the required units specified, net content may be expressed in metric units.

(6) Variation above minimum content or around an average is permissible only to the extent that it represents deviation unavoidable in good manufacturing practice. Variation below a stated minimum is not permitted. In no case shall the average content of the packages in a shipment fall below the stated average content.

(e) *Product registration number.* The registration number assigned to the pesticide product at the time of registration shall appear on the label, preceded by the phrase "EPA Registration No.," or the phrase "EPA Reg. No." The registration number shall be set in type of a size and style similar to other print on that part of the label on which it appears and shall run parallel to it. The registration number and the required identifying phrase shall not appear in such a manner as to suggest or imply recommendation or endorsement of the product by the Agency.

(f) *Producing establishments registration number.* The producing establishment registration number preceded by the phrase "EPA Est.", of the final establishment at which the product was produced may appear in any suitable location on the label or immediate container. It must appear on the wrapper or outside container of the package if the EPA establishment registration number on the immediate container cannot be clearly read through such wrapper or container.

(g) *Ingredient statement*—(1) *General.* The label of each pesticide product must bear a statement which contains the name and percentage by weight of each active ingredient, the total percentage by weight of all inert ingredients; and if the pesticide contains arsenic in any form, a statement of the percentages of total and water-soluble arsenic calculated as elemental arsenic. The active ingredients must be designated by the term "active ingredients" and the inert ingredients by the term "inert ingredients," or the singular forms of these terms when appropriate. Both terms shall be in the same type size, be aligned to the same margin and be equally prominent. The statement "Inert Ingredients, none" is not required for pesticides which contain 100 percent active ingredients. Unless the ingredient statement is a complete analysis of the pesticide, the term "analysis" shall not be used as a heading for the ingredient statement.

(2) *Position of ingredient statement.* (i) The ingredient statement is normally required on the front panel of the label. If there is an outside container or wrapper through which the ingredient statement cannot be clearly read, the ingredient statement must also appear on such outside container or wrapper. If the size or form of the package makes it impracticable to place the ingredient statement on the front panel of the label, permission may be granted for the ingredient statement to appear elsewhere.

(ii) The text of the ingredient statement must run parallel with other text on the panel on which it appears, and must be clearly distinguishable from and must not be placed in the body of other text.

(3) *Names to be used in ingredient statement.* The name used for each ingredient shall be the accepted common name, if there is one, followed by the chemical name. The common name may be used alone only if it is well known. If no common name has been established, the chemical name alone shall be used. In no case will the use of a trademark or proprietary name be permitted unless such name has been accepted as a common name by the Administrator under the authority of Section 25(c)(6).

(4) *Statements of percentages.* The percentages of ingredients shall be stated in terms of weight-to-weight. The sum of percentages of the active and the inert ingredients shall be 100. Percentages shall not be expressed by a range of values such as "22-25%." If the uses of the pesticide product are expressed as weight of active ingredient per unit area, a statement of the weight of active ingredient per unit volume of the pesticide formulation shall also appear in the ingredient statement.

(5) *Accuracy of stated percentages.* The percentages given shall be as precise as possible reflecting good manufacturing practice. If there may be unavoidable variation between manufacturing batches, the value stated for each active ingredient shall be the lowest percentage which may be present.

(6) *Deterioration.* Pesticides which change in chemical composition significantly must meet the following labeling requirements:

(i) In cases where it is determined that a pesticide formulation changes chemical composition significantly, the product must bear the following statement in a prominent position on the label: "Not for sale or use after [date]."

(ii) The product must meet all label claims up to the expiration time indicated on the label.

(7) *Inert ingredients.* The Administrator may require the name of any inert ingredient(s) to be listed in the ingredient statement if he determines that such ingredient(s) may pose a hazard to man or the environment.

(h) *Warnings and precautionary statements.* Required warnings and precautionary statements concerning the general areas of toxicological hazard including hazard to children, environmental hazard, and physical or chemical hazard fall into two groups, those required on the front panel of the labeling and those which may appear elsewhere. Specific requirements concerning content, placement, type size, and prominence are given below.

(1) *Required front panel statements.* With the exception of the child hazard warning statement, the text required on the front panel of the label is determined by the Toxicity Category of the pesticide. The category is assigned on the basis of the highest hazard shown by any of the indicators in the table below:

Hazard indicators	Toxicity categories			
	I	II	III	IV
Oral LD_{50}	Up to and including 50 mg/kg	From 50 thru 500 mg/kg	From 500 thru 5000 mg/kg	Greater than 5000 mg/kg
Inhalation LC_{50}	Up to and including .2 mg/liter	From .2 thru 2 mg/liter	From 2 thru 20 mg/liter	Greater than 20 mg/liter
Dermal LD_{50}	Up to and including 200 mg/kg	From 200 thru 2000	From 2,000 thru 20,000	Greater than 20,000
Eye effects	Corrosive; corneal opacity not reversible within 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible within 7 days	No irritation
Skin effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation at 72 hours

(i) *Human hazard signal word*—(A) *Toxicity Category I.* All pesticide products meeting the criteria of Toxicity Category I shall bear on the front panel the signal word "Danger." In addition if the product was assigned to Toxicity Category I on the basis of its oral, inhalation or dermal toxicity (as distinct from skin and eye local effects) the word "Poison" shall appear in red on a background of distinctly contrasting color and the skull and crossbones shall appear in immediate proximity to the word "poison."

(B) *Toxicity Category II.* All pesticide products meeting the criteria of Toxicity Category II shall bear on the front panel the signal word "Warning."

(C) *Toxicity Category III.* All pesticide products meeting the criteria of Toxicity Category III shall bear on the front panel the signal word "Caution."

(D) *Toxicity Category IV.* All pesticide products meeting the criteria of Toxicity Category IV shall bear on the front panel the signal word "Caution."

(E) *Use of signal words.* Use of any signal word(s) associated with a higher Toxicity Category is not permitted except when the Agency determines that such labeling is necessary to prevent unreasonable adverse effects on man or the environment. In no case shall more than one human hazard signal word appear on the front panel of a label.

(ii) *Child hazard warning.* Every pesticide product label shall bear on the front panel the statement "keep out of reach of children." Only in cases where the likelihood of contact with children during distribution, marketing, storage or use is demonstrated by the applicant to be extremely remote, or if the nature of the pesticide is such that it is approved for use on infants or small children, may the Administrator waive this requirement.

(iii) *Statement of practical treatment*—(A) *Toxicity Category I.* A statement of practical treatment (first aid or other) shall appear on the front panel of the label of all pesticides falling into Toxicity Category I on the

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basis of oral, inhalation or dermal toxicity. The Agency may, however, permit reasonable variations in the placement of the statement of practical treatment is some reference such as "See statement of practical treatment on back panel" appears on the front panel near the word "Poison" and the skull and crossbones.

(B) *Other toxicity categories.* The statement of practical treatment is not required on the front panel except as described in paragraph (h)(1)(iii)(A) of this section. The applicant may, however, include such a front panel statement at his option. Statements of practical treatment are, however, required elsewhere on the label in accord with paragraph (h)(2) of this section if they do not appear on the front panel.

(iv) *Placement and prominence.* All the require front panel warning statements shall be grouped together on the label, and shall appear with sufficient prominence relative to other front panel text and graphic material to make them unlikely to be overlooked under customary conditions of purchase and use. The following table shows the minimum type size requirements for the front panel warning statements on various sizes of labels:

Size of label front panel in square inches	Points	
	Required signal word, all capitals	"Keep out of reach of Children"
5 and under	6	6
Above 5 to 10	10	6
Above 10 to 15	12	8
Above 15 to 30	14	10
Over 30	18	12

(2) *Other required warnings and precautionary statements.* The warnings and precautionary statements as required below shall appear together on the label under the general heading "Precautionary Statements" and under appropriate subheadings of "Hazard to Humans and Domestic Animals," "Environmental Hazard" and "Physical or Chemical Hazard."

(i) *Hazard to humans and domestic animals.* (A) Where a hazard exists to humans or domestic animals, precautionary statements are required indicating the particular hazard, the route(s) of exposure and the precautions to be taken to avoid accident, injury or damage. The precautionary paragraph shall be immediately preceded by the appropriate hazard signal word.

(B) The following table depicts typical precautionary statements. These statements must be modified or expanded to reflect specific hazards.

Toxicity category	Precautionary statements by toxicity category	
	Oral, inhalation, or dermal toxicity	Skin and eye local effects
I	Fatal (poisonous) if swallowed [inhaled or absorbed through skin]. Do not breathe vapor [dust or spray mist]. Do not get in eyes, on skin, or on clothing. [Front panel statement of practical treatment required.]	Corrosive, causes eye and skin damage [or skin irritation]. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed. [Appropriate first aid statement required.]
II	May be fatal if swallowed [inhaled or absorbed through the skin]. Do not breathe vapors [dust or spray mist]. Do not get in eyes, on skin, or on clothing. [Appropriate first aid statements required.]	Causes eye [and skin] irritation. Do not get in eyes, on skin, or on clothing. Harmful if swallowed. [Appropriate first aid statement required.]
III	Harmful if swallowed [inhaled or absorbed through the skin]. Avoid breathing vapors [dust or spray mist]. Avoid contact with skin [eyes or clothing]. [Appropriate first aid statement required.]	Avoid contact with skin, eyes or clothing. In case of contact immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists.
IV	[No precautionary statements required.]	[No precautionary statements required.]

(ii) *Environmental hazards.* Where a hazard exists to non target organisms excluding humans and domestic animals, precautionary statements are required stating the nature of the hazard and the appropriate precautions to avoid potential accident, injury or damage. Examples of the hazard statements and the circumstances under which they are required follow:

(A) If a pesticide intended for outdoor use contains an active ingredient with a mammalian acute oral LD_{50} of 100 or less, the statement "This Pesticide is Toxic to Wildlife" is required.

(B) If a pesticide intended for outdoor use contains an active ingredient with a fish acute LC_{50} of 1 ppm or less, the statement "This Pesticide is Toxic to Fish" is required.

(C) If a pesticide intended for outdoor use contains an active ingredient with an avian acute oral LD_{50} of 100 mg/kg or less, or a subacute dietary LC_{50} of 500 ppm or less, the statement "This Pesticide is Toxic to Wildlife" is required.

(D) If either accident history or field studies demonstrate that use of the pesticide may result in fatality to birds, fish or mammals, the statement "This pesticide is extremely toxic to wildlife (fish)" is required.

(E) For uses involving foliar application to agricultural crops, forests, or shade trees, or for mosquito abatement treatments, pesticides toxic to pollinating insects must bear appropriate label cautions.

(F) For all outdoor uses other than aquatic applications the label must bear the caution "Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of wastes."

(iii) *Physical or chemical hazards.* Warning statements on the flammability or explosive characteristics of the pesticide are required as follows:

Flash point	Required text
(A) PRESSURIZED CONTAINERS	
Flash point at or below 20° F; if there is a flashback at any valve opening	Extremely flammable. Contents under pressure. Keep away from fire, sparks, and heated surfaces. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.
Flash point above 20° F and not over 80° F or if the flame extension is more than 18 in long at a distance of 6 in from the flame	Flammable. Contents under pressure. Keep away from heat, sparks, and open flame. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.
All other pressurized containers	Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.
(B) NONPRESSURIZED CONTAINERS	
At or below 20° F	Extremely flammable. Keep away from fire, sparks, and heated surfaces.
Above 20° F and not over 80° F	Flammable. Keep away from heat and open flame.
Above 80° F and not over 150° F	Do not use or store near heat or open flame.

(i) *Directions for Use*—(1) *General requirements*—(i) *Adequacy and clarity of directions.* Directions for use must be stated in terms which can be easily read and understood by the average person likely to use or to supervise the use of the pesticide. When followed, directions must be adequate to protect the public from fraud and from personal injury and to prevent unreasonable adverse effects on the environment.

(ii) *Placement of directions for use.* Directions may appear on any portion of the label provided that they are conspicuous enough to be easily read by the user of the pesticide product. Directions for use may appear on printed or graphic matter which accompanies the pesticide provided that:

(A) If required by the Agency, such printed or graphic matter is securely attached to each package of the pesticide, or placed within the outside wrapper or bag;

(B) The label bears a reference to the directions for use in accompanying leaflets or circulars, such as "See directions in the enclosed circular:" and

(C) The Administrator determines that it is not necessary for such directions to appear on the label.

(iii) *Exceptions to requirement for direction for use*—(A) Detailed directions for use may be omitted from labeling of pesticides which are intended for use only by manufacturers of products other than pesticide products in their regular manufacturing processes, provided that:

(1) The label clearly shows that the product is intended for use only in manufacturing processes and specifies the type(s) of products involved.

(2) Adequate information such as technical data sheets or bulletins, is available to the trade specifying the type of product involved and its proper use in manufacturing processes;

(3) The product will not come into the hands of the general public except after incorporation into finished products; and

(4) The Administrator determines that such directions are not necessary to prevent unreasonable adverse effects on man or the environment.

(B) Detailed directions for use may be omitted from the labeling of pesticide products for which sale is limited to physicians, veterinarians, or druggists, provided that:

(1) The label clearly states that the product is for use only by physicians or veterinarians;

(2) The Administrator determines that such directions are not necessary to prevent unreasonable adverse effects on man or the environment; and

(3) The product is also a drug and regulated under the provisions of the Federal Food, Drug and Cosmetic Act.

(C) Detailed directions for use may be omitted from the labeling of pesticide products which are intended for use only by formulators in preparing pesticides for sale to the public, provided that:

(1) There is information readily available to the formulators on the composition, toxicity, methods of use, applicable restrictions or limitations, and effectiveness of the product for pesticide purposes;

(2) The label clearly states that the product is intended for use only in manufacturing, formulating, mixing, or repacking for use as a pesticide and specifies the type(s) of pesticide products involved;

(3) The product as finally manufactured, formulated, mixed, or repackaged is registered; and

(4) The Administrator determines that such directions are not necessary to prevent unreasonable adverse effects on man or the environment.

(2) *Contents of Directions for Use.* The directions for use shall include the following, under the headings "Directions for Use":

(i) The statement of use classification as prescribed in 162.10(j) immediately under the heading "Directions for Use."

(ii) Immediately below the statement of use classification, the statement "It is a violation of Federal law to use this product in a manner inconsistent with its labeling."

(iii) The site(s) of application, as for example the crops, animals, areas, or objects to be treated.

(iv) The target pest(s) associated with each site.

(v) The dosage rate associated with each site and pest.

(vi) The method of application, including instructions for dilution, if required, and type(s) of application apparatus or equipment required.

(vii) The frequency and timing of applications necessary to obtain effective results without causing unreasonable adverse effects on the environment.

(viii) Specific limitations on reentry to areas where the pesticide has been applied, meeting the requirements concerning reentry provided by 40 CFR Part 170.

(ix) Specific directions concerning the storage and disposal of the pesticide and its container, meeting the requirements of 40 CFR Part 165. These instructions shall be grouped and appear under the heading "Storage and Disposal." This heading must be set in type of the same minimum sizes as required for the child hazard warning (See Table in § 162.10(h)(1)(iv).)

(x) Any limitations or restrictions on use required to prevent unreasonable adverse effects, such as:

(A) Required intervals between application and harvest of food or feed crops.

(B) Rotational crop restrictions.

(C) Warnings as required against use on certain crops, animals, objects, or in or adjacent to certain areas.

(D) [Reserved]

(E) For restricted use pesticides, a statement that the pesticide may be applied under the direct supervision of a certified applicator who is not physically present at the site of application but nonetheless available to the person applying the pesticide, unless the Agency has determined that the pesticide may only be applied under the direct supervision of a certified applicator who is physically present.

(F) Other pertinent information which the Administrator determines to be necessary for the protection of man and the environment.

(j) *Statement of Use Classification.* By October 22, 1976, all pesticide products must bear on their labels a statement of use classification as described in paragraphs (j)(1) and (2) of this section. Any pesticide product for which some uses are classified for general use and others for restricted use shall be separately labeled according to the labeling standards set forth in this subsection, and shall be marketed as separate products with different registration numbers, one bearing directions only for general use(s) and the other bearing directions for restricted use(s) except that, if a product has both restricted use(s) and general use(s), both of these uses may appear on a product labeled for restricted use. Such products shall be subject to the provisions of § 162.10(j)(2).

(1) *General Use Classification.* Pesticide products bearing directions for use(s) classified general shall be labeled with the exact words "General Classification" immediately below the heading "Directions for Use." And reference to the general classification that suggests or implies that the general utility of the pesticide extends beyond those purposes and uses contained in the Directions for Use will be considered a false or misleading statement under the statutory definitions of misbranding.

(2) *Restricted Use Classification.* Pesticide products bearing direction for use(s) classified restricted shall bear statements of restricted use classification on the front panel as described below:

(i) *Front panel statement of restricted use classification.* (A) At the top of the front panel of the label, set in type of the same minimum sizes as required for human hazard signal words (see table in § 162.10(h)(1)(iv)), and appearing with sufficient prominence relative to other text and graphic material on the front panel to make it unlikely to be overlooked under customary conditions of purchase and use, the statement "Restricted Use Pesticide" shall appear.

(B) Directly below this statement on the front panel, a summary statement of the terms of restriction imposed as a precondition to registration shall appear. If use is restricted to certified applicators, the following statement is required: "For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification." If, however, other regulatory restrictions are imposed, the Administrator will define the appropriate wording for the terms of restriction by regulation.

(k) Advertising. [Reserved]

[40 FR 28268, July 3, 1975; 40 FR 32329, Aug. 1, 1975; 40 FR 36571, Aug. 21, 1975, as amended at 43 FR 5786, Feb. 9, 1978]

PHYSICAL/CHEMICAL HAZARDS

Criteria	Required Label Statement
I. Pressurized Containers	
A. Flashpoint at or below 20°F; or if there is a flashback at any valve opening.	Extremely flammable. Contents under pressure. Keep away from fire, sparks, and heated surfaces. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.
B. Flashpoint above 20°F and not over 80°F; or if the flame extension is more than 18 inches long at a distance of 6 inches from the valve opening.	Flammable. Contents under pressure. Keep away from heat, sparks, and flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.
C. All Other Pressurized Containers	Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.
II. Non-Pressurized Containers	
A. Flashpoint at or below 20°F.	Extremely flammable. Keep away from fire, sparks, and heated surfaces.
B. Flashpoint above 20°F and not over 80°F.	Flammable. Keep away from heat and open flame.
C. Flashpoint over 80°F and not over 150°F.	Do not use or store near heat and open flame.
D. Flashpoint above 150°F.	None required.

STORAGE INSTRUCTIONS FOR PESTICIDES

Heading:

All products are required to bear specific label instructions about storage and disposal. Storage and disposal instructions must be grouped together in the directions for use portion of the label under the heading STORAGE AND DISPOSAL. Products intended solely for domestic use need not include the heading "STORAGE AND DISPOSAL."

Storage Instructions:

All product labels are required to have appropriate storage instructions. Specific storage instructions are not prescribed. Each registrant must develop his own storage instructions, considering, when applicable, the following factors:

1. Conditions of storage that might alter the composition or usefulness of the pesticide. Examples could be temperature extremes, excessive moisture or humidity, heat, sunlight, friction, or contaminating substances or media.

2. Physical requirements of storage which might adversely affect the container of the product and its ability to continue to function properly. Requirements might include positioning of the container in storage, storage or damage due to stacking, penetration of moisture, and ability to withstand shock or friction.

3. Specifications for handling the pesticide container, including movement of container within the storage area, proper opening and closing procedures (particularly for opened containers), and measures to minimize exposure while opening or closing container.

4. Instructions on what to do if the container is damaged in any way, or if the pesticide is leaking or has been spilled, and precautions to minimize exposure if damage occurs.

5. General precautions concerning locked storage, storage in original container only, and separation of pesticides during storage to prevent cross-contamination of other pesticides, fertilizer, food, and feed.

6. General storage instructions for household products should emphasize storage in original container and placement in locked storage areas.

PESTICIDE DISPOSAL INSTRUCTIONS

The label of all products, except those intended solely for domestic use, must bear explicit instructions about pesticide disposal. The statements listed below contain the exact wording that must appear on the label of these products:

1. The labels of all products, except domestic use, must contain the statement, "Do not contaminate water, food, or feed by storage or disposal."

2. Except those products intended solely for domestic use, the labels of all products that contain active ingredients that are Acute Hazardous Wastes (see list in this Appendix) or are assigned to Toxicity Category I on the basis of oral or dermal toxicity, skin or eye irritation potential, or Toxicity Category I or II on the basis of acute inhalation toxicity must bear the following pesticide disposal statement:

> "Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance."

3. The labels of all products, except those intended for domestic use, containing active or inert ingredients that are Toxic Hazardous Wastes (see list in this Appendix) or meet any of the criteria in 40 CFR 261, Subpart C for a hazardous waste must bear the following pesticide disposal statement:

> "Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance."

4. Labels for all other products, except those intended for domestic use, must bear the following pesticide disposal statement:

> "Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility."

5. Products intended for domestic use only must bear the following disposal statement: "Securely wrap original container in several layers of newspaper and discard in trash."

CONTAINER DISPOSAL INSTRUCTIONS

The label of each product must bear container disposal instructions appropriate to the type of container.

1. Domestic use products must bear one of the following container disposal statements:

Container Type	Statement
Non-aerosol products (bottles, cans, jars)	Do not reuse container (bottle, can, jar). Rinse thoroughly before discarding in trash.
Non-aerosol products (bags)	Do not reuse bag. Discard bag in trash.
Aerosol products	Replace cap and discard containers in trash. Do not incinerate or puncture.

2. All other products must bear container disposal instructions, based on container type, listed below:

Container Type	Statement
Metal containers (non-aerosol)	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.
Plastic containers	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.
Glass containers	Triple rinse (or equivalent). Then dispose of in a sanitary landfill or by other approved state and local procedures.
Fiber drums with liners	Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by state and local authorities. If drum is contaminated and cannot be reused[1], dispose of in the same manner.
Paper and plastic bags	Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.
Compressed gas cylinders	Return empty cylinder for reuse (or similar wording)

[1] Manufacturer may replace this phrase with one indicating whether and how fiber drum may be reused.

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Processed Foods 64
Tarpaulins 64
(Agricultural Premises and Equipment) 65
Barns 65
Farm Storage Areas 66
Greenhouses (Empty) 66
Mushroom Houses (Empty) 66
Poultry Houses (Empty) 67
(Household) 67
Domestic Dwelling Contents (including Furniture) 67
Domestic Dwellings (including Garages) 67
(Wood or Wood Structure Protection Treatment) 69
Lumber and Wood Products 69
(Commercial and Industrial Uses) 69
Boxcars/Railway Cars (Empty) 69
Food Processing, Handling and Storage Areas 70
Meat Processing Plants (including Ham Houses) 71
Ships (Cargo)/Steel Barges 71
Trailers (Empty) 72
Van Containers (Empty) 72

c053201

METHYL BROMIDE*

TYPE PESTICIDE: Acaricide, Fungicide, Herbicide, Insecticide, Nematicide, Rodenticide and Fumigant

FORMULATIONS:
Tech (100%)
FI (67%)
PrGs (33%, 43%, 45%, 50%, 57%, 66%, 67%, 68.6%, 70%, 75%, 80%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100%)

GENERAL WARNINGS AND LIMITATIONS: RESTRICTED USE PESTICIDE. Extremely hazardous liquid and vapor under pressure. Inhalation may be fatal or cause serious acute illness or delayed lung, nerve or brain injury. Do not breathe vapor. Liquid or vapor can cause serious skin or eye injury which may have a delayed onset. Do not get liquid on skin, in eyes or on clothing. Wear full-body clothing that is cleaned after each wearing, or disposable protective clothing. Do not wear gloves or boots when handling. Methyl bromide is heavier than air and may be trapped inside and cause skin injury. If full-face respiratory protection is not required, wear goggles or full face shield for eye protection when handling liquid. Do not reuse contaminated clothing or shoes until cleaned. Use only with adequate ventilation when applied to structures and for stored commodity fumigation. Keep children and animals away from areas under treatment. Wear a self contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health under the provision of 30 Code of Federal Regulations Part II.

Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.

Before entering fumigated buildings and structures, determine the presence or absence of harmful concentrations of methyl bromide gas. This can be accomplished with the use of a halide gas detector or thermal conductivity gas detector. Refer to approved labels and technical bulletins for use directions of detectors.

A 5 parts per million (ppm) threshold limit value (TLV) for methyl bromide has been established. Threshold limit value is defined as the concentration below which personal protective devices are not required for persons entering or within a hazardous environment. Persons not wearing protective equipment should not enter the fumigated area until monitoring devices show methyl bromide concentrations of 5 parts per million or less.

Methyl bromide may be formulated with chloropicrin.

*bromomethane

GENERAL WARNINGS AND LIMITATIONS (continued)

Commodities Unsuited for Methyl Bromide Fumigations. The following is a list of materials which should not be exposed to methyl bromide:

1. Foodstuffs
    a. Iodized salt stabilized with sodium hyposulfite.
    b. Full fat soya flour.
    c. Certain baking sodas, cattle licks (i.e., salt blocks), or other foodstuffs containing reactive sulfur compounds.

Note: Never exceed the recommended dosage or exposure period for food or feedstuff commodities. Prior to repeated fumigation, have the food commodity analyzed for inorganic bromide residues.

2. Seeds, Bulbs, and Plants
    a. Seeds and bulbs to be used for planting.*
    b. Nursery stock and other living plants.*

3. Pets
   (All pets, including fish and birds.)

4. Rubber Goods
    a. Sponge rubber.
    b. Foam rubber, as in pillows, cushions, mattresses, and some car seats.
    c. Rubber stamps and other similar forms of reclaimed rubber.

5. Furs

6. Horsehair

7. Feathers
   (Especially in feather pillows.)

8. Leather goods
   (Particularly white kid or other leather goods tanned with sulfur processes).

9. Woolens
   (Extreme caution should be used in the fumigation of Angora woolens. Some adverse effects have been noted on woolen socks, sweaters, shawls and yarn.)

10. Viscose Rayon
    Those rayons processed or manufactured by a process in which carbon bisulfide is used.

11. Vinyl

*For specific information on procedures to prevent commodity injury, contact manufacturer or United States Department of Agriculture.

GENERAL WARNINGS AND LIMITATIONS (continued)

Commodities Unsuited for Methyl Bromide Fumigations (continued)

12. Paper
    a. Silver polishing papers.
    b. Certain writing and other papers cured by sulfide processes.
    c. Photographic prints and blueprints stored in quantity.
    d. Carbonless carbon paper.
    e. Blueprint papers.

13. Cellophane**

14. Photographic Chemicals
    (Darkroom chemicals, but not cameras or film.)

15. Rug Padding
    (Foam rubber, felt, etc.)

16. Cinder Blocks

17. Mixed Concrete
    (occasionally picks up odors)

18. Mixtures of mortar and/or soil used for chinking log cabins.

19. Charcoal
    (Note: Methyl bromide is readily absorbed by charcoal. This may not only contaminate such materials, but may reduce the concentration of the gas in the fumigated area to the point of ineffectiveness.

**In the event of uncertainty about the possible presence of reactive sulfur compounds, conduct a trial fumigation of a small quantity of the material in question.

PEST VOCABULARY AND LISTING

Methyl bromide labels frequently contain pest names which are broad and nonspecific. Attempts have been made to identify the specific pests falling under such general names. These broad and general pest names appear in this entry unless special use instructions or dosages are claimed for specific pest.

Fungicide Claims

1. Soilborne fungi including:
    a) Armillaria spp.
    b) Crown rot fungi
    c) Fusarium spp.
    d) Plasmodiophora spp.
    e) Phytophthora spp.
    f) Pyrenochaeta spp.
    g) Pythium spp.

GENERAL WARNINGS AND LIMITATIONS (continued)

Fungicide Claims (continued)

h) Rhizoctonia spp.
i) Sclerotinia spp.
j) Sclerotium spp.
k) Verticillium spp.

Herbicide Claims

2. Weeds (including seeds, roots, stolons and bulbs of broadleaf weeds and grasses) including:
    a) Annual bluegrass
    b) Barnyardgrass
    c) Bermudagrass
    d) Broomrape
    e) Chickweed
    f) Common lambsquarters
    g) Crabgrass
    h) Crowfootgrass
    i) Goosegrass
    j) Morningglory
    k) Nutsedge
    l) Oxalis
    m) Pigweed
    n) Purslane
    o) Torpedograss

Note: Methyl bromide is ineffective against some species of clover, dodder, filaree, mallow and other hard-seeded weeds.

Insecticide Claims

3. Soilborne insects including:
    a) Garden symphylan
    b) June beetles (larvae)
    c) White grubs
    d) Wireworms

4. Stored product insects including:
    a) Angoumois grain moth
    b) Australian spider beetle
    c) Bamboo powderpost beetle
    d) Bean weevil
    e) Black carpet beetle
    f) Cadelle
    g) Carpet beetle
    h) Cigarette beetle
    i) Cockroaches
    j) Coffee bean weevil
    k) Confused flour beetle
    l) Cowpea weevil
    m) Dermestid beetle
    n) Driedfruit beetle

GENERAL WARNINGS AND LIMITATIONS (continued)

Insecticide Claims (continued)

o) Drugstore beetle
p) Flat grain beetle
q) Fungus beetle
r) Furniture beetle
s) Grain borers
t) Grain mite
u) Granary weevil
v) Hairy fungus beetle
w) Indianmeal moth
x) Khapra beetle
y) Larder beetle
z) Leafminers
aa) Lesser grain borer
bb) Mealworms
cc) Mediterranean flour moth
dd) Merchant grain beetle
ee) Odd beetle
ff) Otiorhyncus weevils
gg) Pea weevil
hh) Raisin moth
ii) Red flour beetle
jj) Redlegged ham beetle
kk) Rice weevil
ll) Rusty grain beetle
mm) Sawtoothed grain beetle
nn) Seed weevils
oo) Sweetpotato weevil
pp) Tapestry/carpet moth
qq) Trogoderma beetle
rr) Varied carpet beetle
ss) Warehouse beetle
tt) Whitefringed beetles

Note: The dosage rates used to control the life stages of Khapra beetle are covered by the recommendations and instructions issued by the United States Department of Agriculture food quarantine programs, to be used only by or under the direction of federal/state quarantine treatments.

5. Wood destroying insects including:
    a) Ambrosia beetles
    b) Anobiid powderpost beetles
    c) Bark beetles
    d) Bostrichid beetles
    e) Carpenter ants
    f) Carpenter bee
    g) Drywood termites
    h) Flatheaded wood borers
    i) Lyctid beetles

GENERAL WARNINGS AND LIMITATIONS (continued)

Insecticide Claims (continued)

- j) Old house borer
- k) Roundheaded wood borers
- l) White pine weevil

Nematicide Claims

6. Nematodes including:
    - a) Burrowing nematode
    - b) Citrus nematode
    - c) Dagger nematodes
    - d) Lance nematodes
    - e) Lesion nematodes
    - f) Pin nematodes
    - g) Root-knot nematodes
    - h) Spiral nematodes
    - i) Sting nematodes
    - j) Stunt nematodes
    - k) Criconemoides spp.

Tolerances:

The following sections of Code of Federal Regulations (CFR) list tolerances for residues for methyl bromide:

CFR 180.123 - Inorganic bromides resulting from fumigation with methyl bromide.
CFR 180.199 - Inorganic bromides resulting from soil treatment with combinations of chloropicrin, methyl bromide and propargyl bromide.
CFR 193.225 - Fumigants, including carbon disulfide, carbon tetrachloride, ethylene dibromide, ethylene dichloride, and/or methyl bromide.
CFR 193.230 - Fumigants, including carbon tetrachloride, carbon disulfide, ethylene dichloride, pentane, and/or methyl bromide.
CFR 193.250 and 561.260 - Inorganic bromide in certain processed foods.

Agricultural Crop Tolerances (other than those listed in the text):

The tolerances of raw agricultural commodities are established for residues of inorganic bromides (calculated as bromine) which have been fumigated with methyl bromide after harvest:

Avocados - 75 ppm
Blueberries - 20 ppm
Coffee Beans - 75 ppm
Cumin, Seed - 100 ppm
Ginger, Roots - 100 ppm
Mangoes - 20 ppm
Papayas - 20 ppm
Pomegranates - 100 ppm
Soybeans - 200 ppm

GENERAL WARNINGS AND LIMITATIONS (continued)

Agricultural Crop Tolerances (continued)

Timothy, Hay - 50 ppm

Processed Food/Feed Commodity Tolerances (other than those listed in the text):

The tolerances of processed food/feed commodities are expressed as inorganic bromides.

Citrus Pulp, Dehydrated	- 90 ppm
Malt Beverages	- 25 ppm
Tomato Products, Concentrated	- 250 ppm

TERRESTRIAL FOOD CROP

General Warnings and Limitations: When fumigating soil, observe these precautions:

Drivers of application equipment must advise other workers of all precautions and procedures. In addition, drivers must instruct their helpers in the mechanical operation of the tractor and how to safely work with the tractor and driver while fumigating.

Handle this fumigant in the open, with the operator upwind from the container where there is good ventilation.

Always have adequate clean water available to wash skin and/or flush eyes. When fumigating soil from a tractor, 5 gallons of water must be carried on the tractor and placed where it is readily accessible. In addition to water available on the tractor, at least 5 gallons of additional water must be available from the service truck. The water must be drinkable but in containers marked "WATER NOT FOR DRINKING".

Check fumigant pressure system for leaks before beginning operation.

Do not lift injection shanks to turn at end of a pass until fumigant has drained from system following closure of shutoff valve.

Trash pulled by the shanks to the end of the field when fumigating must be covered by lifting the shanks, then covering the trash with polyethylene film before making the turn for the next pass.

In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Get off tractor and get to a place where the problem can be observed without exposure to fumes. Approach from upwind with respiratory protection if required, and make necessary repairs.

When changing the cylinders be certain they are turned off and fumigant system is not under pressure. Do not open the system when there are people or structures downwind.

Post all treated areas with warning signs.

Keep all animals, children and unauthorized people away from area under fumigation during the exposure period and during removal of tarpaulin.

Fumigation with methyl bromide and/or chloropicrin sometimes slows down the rate of nitrification (the conversion to nitrates from ammonia by bacterial action). Certain ammonia-sensitive plants such as tomatoes may suffer growth inhibition or stand reduction when planted in fumigated soils containing high amounts of ammonia nitrogen. Accumulation of ammonium is most likely to occur when maximum rates of fumigant and fertilizer are applied to soils that are acidic, wet, cold or high in organic matter.

General Warnings and Limitations (continued)

To lessen this hazard, at least one-half and preferably all of the nitrogen fertilizer added immediately before or soon after fumigation should be in the form of nitrate nitrogen. This hazard may also be reduced by delaying planting until several months after fumigation if a nitrate form of nitrogen such as sodium or calcium nitrate is not readily available. Ammonium nitrate used sparingly will supply the nitrogen needed without risk. Phosphorous, potassium and other plant nutrients should be used according to soil needs.

Application should be made several months prior to planting to soils high in organic matter such as muck, compost, and heavily manured soils since they seem more likely to undergo some changes (possible effect on microorganisms) resulting in poor growth.

Do not treat very cold (below 50 F or 10.0 C), very wet, or dry soils.

Be sure treated plots are free from gas before planting seed or setting out plants. If there is doubt as to complete aeration, working the soil after treatment will aid, particularly when the soil is cool and/or wet.

Do not contaminate fumigated areas by walking from unfumigated soil. Clean your shoes thoroughly if this is necessary. If the treated bed is in a location where flooding or washing is possible after rains, plow a furrow or make a trench around the treated area for proper drainage. Wooden frames around the beds are also satisfactory for preventing this type of contamination.

Do not allow domestic animals to feed on crop residues unless a tolerance exists for such use.

Do not feed hay or straw treated directly or harvested from treated soils to any animal.

Undesirable concentrations of chloropicrin following soil fumigation with this material may drift to nearby areas. If this occurs, immediately cover treated area with a plastic tarpaulin. The tarpaulins should remain in place overnight and be removed during the daytime if the escaping vapors reach an undesirable concentration, as indicated by eye irritation, the treated areas should be recovered. Since air movement assists the dilution of the escaping fumes it is most likely that undesirable concentrations will build up during evening or nights when the air is static. Application of this material should not be made when there is little or no air movement or when there is an inversion.

Pretreatment Soil Preparation
Plow or rip the soil to the depth to which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decom-

General Warnings and Limitations (continued)

position prior to fumigation. Soil moisture should be optimum for seed germination. Coarse textured soils can be fumigated with higher moisture content than fine textured soils. For best results, soil should be kept moist for at least 4 days prior to treatment. Do not fumigate if the soil temperature is below 50 F (10.0 C). For best results, fumigate when soil temperature is 60 to 80 F (15.6 to 26.7 C) at the depth of 6 to 8 inches.

Soil Fumigation Methods
Use one of the following preplant methods:

1. Augering method (suitable for use in non-compacted or lightly stratified soils): Dig hole 3 to 5 feet deep with auger and, if necessary back-fill hole to provide final depth of 3 feet. Insert applicator tube or probe, fill hole and release entire dosage for 100 square foot site. When fumigant has been completely released, remove applicator and tamp or compact hole with soil or cover site with polyethylene tarp for 7 days.

2. Back-Hoe method (especially suitable in highly compacted, hard pan soils): In stratified soils dig a trench 5 feet deep, 6 feet long and as wide as the hoe; in deeply compacted soil, prepare a site the size of the area in which the tree is to be grown. Back-fill with 2 feet of soil, place applicator outlet at the 3-foot level and complete back-fill. Release entire dose for 100 square feet, remove applicator and tamp soil lightly over opening to seed fumigant in the site.

3. Chisel method (suitable for light, non-compacted soils): Rip dry soil to a depth of 18 to 24 inches, disk to smoothness, inject fumigant by chisel application to a depth of 36 inches and cover with polyethylene film for 7 days. For overall field fumigation, using a chisel type applicator, inject the product with the chisels spaced no more than 12 inches apart. Inject the fumigant to a depth of 6 to 8 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing with a roller or a cultipacker and covered within 20 minutes with polyethylene film or other suitable cover.

4. Hot gas method: The method consists of using a commercially manufactured heat exchanger or a copper coil immersed in a vessel containing hot water, to vaporize the fumigant before introduction. This method is useful where large amounts of fumigant are required and rapid vaporization is advantageous.

5. Raised tarp fumigation method: Support the center of the cover to provide a small gas dome. Inflated plastic bags, crumpled fertilizer bags, burlap bags stuffed lightly with hay or straw, inverted baskets, flowerpots or bottles placed in the soil may be used for support.

General Warnings and Limitations (continued)

Evaporating pans are essential for the volatilization and uniform dispersion of fumigant. Shallow pans or basins made of plastic or tinned sheet metal are satisfactory for this purpose.

a) Use 1 evaporator pan for each 300 to 400 square feet of area.
b) Anchor one end of each polyethylene tube into an evaporating pan with tape or a suitable weight. This insures that the liquid will be directed into the evaporating pan.
c) Extend the free ends of the polyethylene tubes outside of the area to be covered.
d) After the supports and tubing are in place, cover the area to be fumigated with a gasproof cover of polyethylene or coated fabric film.
e) Position the cover with its edges in a prepared furrow or trench.
f) Seal 6 to 10 inches of the outside edges with dirt. Tamp the dirt down so edges will not pull loose.
g) Attach a polyethylene tube to the cylinder value outlet and open. Use a cylinder dispenser or scale to meter small amounts.

6. Tree site injector method (suitable for light, non-compacted soils): Insert injector into soil to a depth of 18 inches or more, tamp soil lightly around injector, release entire dose for 100 square feet site, move away from injector until all fumigant has been released, then remove injector and seal hole with tamped soil.

Equipment Calibration: Calibrate fumigation equipment accurately before application. Refer to labels to determine proper orifice size and pressure required to deliver the desired dosage.

Exposure and Aeration Periods: In general, expose for 24 hours when temperature is above 60 F (15.6 C) and for 48 hours when temperature is between 50 to 60 F (10.0 to 15.6 C). After the exposure, aerate soil for 3 days before seeding or 5 to 14 days before setting out vegetative growth. If odor of fumigants persist at the end of aeration period, disc or plow the soil to assist aeration.

Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations

General Warnings and Limitations (continued)

Special Instructions for the Control of Armillaria Root Rot (Armillaria melea) on Deciduous Fruits and Nuts, Citrus and Vineyards

Pretreatment Soil Preparation: To obtain the maximum control of Armillaria mellea, soil must be dry to a depth requiring treatment. This can be accomplished by: a) planting sudangrass in the spring, irrigating until the grass has established itself, then withholding further irrigation; b) by naturally allowing plants to grow without irrigation. When soil is dry, cut and remove grass, plants and debris. Rip soil to a depth of 36 inches and disc to smoothness.

Methods of Application: This is a preplant or replant treatment. Do not apply to soil where trees or vines will bear harvestable fruit within 24 months. Methods of application are as follows.

1. Non-tarp Chisel Application (Not for Use in CA). After the soil has been properly prepared, inject dosage by chisel application with chisels spaced 48 to 66 inches apart to a depth of 24 to 30 inches. In the row strip, treatments may be made by using a single shank. Chisels should have a wing welded on the back 2 to 4 inches above the chemical outlet to partially break the chisel mark. To fill in the chisel mark and seal the surface, disc and ringroll immediately after fumigant injection. Be sure that the disc and ringroller cover an area sufficiently beyond the chisel lines to effect a good seal.
2. Tarp Chisel Application. After the soil has been properly prepared, apply dosage by chisels spaced 48 to 66 inches apart and cover with adequate polyethylene film seal.
3. Deep Injection Auger-Probe Treatment. Use 1 pound active per injection site in light soils (2 pounds in fine-textured soils) to a depth of 36 inches or more below the soil surface. Use 1 injection site per 100 square feet (on a 10 feet by 10 feet grid pattern) with the injection in the center of the area to be treated.

Exposure and Aeration Period: To insure the proper time-concentration relationship to control Armillaria root rot, expose for 7 days before removing the polyethylene film cover for chisel applications, and expose for a 1 day interval with deep injection auger-probe treatment. Planting or replanting of trees, vines or other deep-rooted crops may begin 14 days after the period of exposure.

General Warnings and Limitations (continued)

Special Instructions for Non-Tarp Nematode Control on Deciduous Fruits and Nuts, Citrus and Vineyards

Pretreatment Soil Preparation: Plow or rip the soil to the depth to which effective treatment is required. The soil should be worked until free of clods or large lumps and residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. To insure maximum fumigant penetration, the soil at the point of injection should not contain more than 5 to 15 percent moisture depending on soil type. However, to improve sealing, the soil surface may be moistened by means of a sprinkler application of 0.25 to 0.5 inch of water prior to final penetration and application. Avoid treatment of soils that contain more than 30 percent clay or those with high organic content. For best results, fumigate when the soil temperature is 60 to 80 F (15.6 to 26.7 C) at the depth of 6 inches. Do not fumigate when soil temperature is below 50 F (10.0 C).

Methods of Application: This is a preplant or replant treatment. Do not apply to soil where trees or vines will bear harvestable fruit within 24 months. A waiting period of at least 14 days should be observed between application and planting. Methods of application are as follows:

1. Chisel Application. After the soil has been properly prepared, inject fumigant with chisels spaced up to 66 inches apart to a depth of 24 to 30 inches. In the row strip, treatments may be made by using a single shank. Chisels should have a wing welded on the back 2 to 4 inches above the chemical outlet to partially break the chisel mark. To fill in the chisel mark and seal the surface, disc and ringroll immediately after fumigant injection. Be sure that the disc and ringroller cover an area sufficiently beyond the chisel lines to effect a good seal.
2. Deep Injection Auger-Probe Treatment. Use 1 pound active per injection site in lighter soils; 2 pounds in fine textured soils. Use 1 injection site per 100 square feet (on a 10 feet by 10 feet grid pattern) with the injection in the center of the area to be treated. Tamp or compact the soil at the point of injection.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Agricultural Crops)		
/16002AA	Asparagus		300 ppm (in combination with chloropicrin) Use limited to CA. One year preharvest interval through 400 pounds per acre.
NABAAAA FKADQBB PAAAAAA	Nematodes Soilborne fungi Weeds	300-400 lb/A (67%, 75%, 80%, 99.5% PrGs)	Preplant soil fumigation.
/13005AA /13008AA /01016AA /06013AA /10001AA /11001AA /11005AA /28017AA	Broccoli Cauliflower		25 ppm (in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
FKAAQBB	Damping-off (including Fusarium, Pythium and Rhizoctonia)	800 lb/A or 2 lb/100 sq.ft (98% PrGs)	Preplant soil fumigation of transplant bed.
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	148-240 lb/A (33%, 45%, 50%, 57%, 66%, 67%, 68.6%, 70%, 75%, 80%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 100% PrGs)	Preplant soil fumigation.
		151-686 lb/A or 1 lb/100 sq.ft (68.6%, 88.2%, 98%, 99.5% PrGs)	Preplant soil fumigation of transplant bed.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cauliflower		See Broccoli cluster.
/02000AA	Citrus Fruit (tree sites)		N.F.
/28038AA	Deciduous Fruit Trees (including Apple, Apricot, Cherry and Peach)		Preplant soil fumigation through 870 pounds per acre.
/03000AA /01014AA	Nut Crops, Nut Trees (including Almond and Walnut)		In colder climates, treat in fall and plant following spring. In warmer climates, do not plant until 30 days after application. Do not apply to soil where trees or vines will bear harvestable fruit within 24 months. A waiting period of at least 14 days should be observed between application and planting. Dosages for the control of nematodes and Armillaria root rot will not usually control weed seeds under very dry conditions. However, some control may be observed on deep-rooted perennials.
FICBABX	Armillaria root rot (Armillaria melea)	400-870 lb/A (98%, 99.5% PrGs)	Not for use in CA. Preplant or replant soil fumigation. Apply by non-tarp chisel application method.
			Preplant or replant soil fumigation. Apply by tarp chisel application method.
		1-2 lb/injection site [1 injection site/100 sq.ft] (98% PrGs)	Preplant or replant soil fumigation. Apply by deep injection auger-probe treatment. Use the lower dose for lighter soil and the higher dose for fine textured soils.
NABAAAA	Nematodes	400-870 lb/A (98%, 99%, 99.5%, 99.65%, 99.75%, 100% PrGs)	Preplant or replant soil fumigation. Apply by chisel application method.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Citrus Fruit (tree sites) cluster (continued)		
		435-870 lb/A (98%, 99%, 99.5%, 99.65%, 99.75%, 100% PrGs)	Preplant soil fumigation. Apply by topical application method.
		1-2 lb/injection site [1 injection site/100 sq.ft (98% PrGs)	Preplant soil fumigation. Apply by deep injection auger-probe treatment. Use the lower dose for lighter soil and the higher dose for fine textured soils.
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	150-650 lb/A (43%, 50%, 67%, 68.6%, 75%, 98%, 99.5%, 100% PrGs) or 1-1.5 lb/100 sq.ft (75%, 98%, 99.5%, 100% PrGs)	Preplant soil fumigation to field, nursery stocks and transplant beds.
/02000AA	(Citrus Fruit (tree sites))		
NEMBABA FKAGPCN	Citrus nematode Phytophthora spp.	0.33-1.5 lb/100 sq.ft (33%, 45%, 50%, 57% 67%, 68.6%, 70%, 75%, 80%, 88.2%, 98%, 99.5%, 100% PrGs)	Use limited to FL sandy soils. Preplant or replant soil fumigation.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/11001AA	Eggplant		20 ppm 60 ppm (in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
		Refer to Broccoli cluster.	
/01014AA	Grapes		N.F. Preplant soil fumigation through 600 pounds per acre.
FKAGABX	Armillaria spp.	400-600 lb/A (98%, 99.5%, 100% PrGs)	Preplant soil fumigation. Apply the lower dose for light sandy soil and the higher dose for fine textured soils.
FKAGPCN	Phytophthora spp.	600 lb/A (98%, 99.5%, 100% PrGs)	Preplant soil fumigation. Treat in summer or fall and plant following spring. Claim for control is limited to sandy and fine textured clay soils.
		Refer to Citrus Fruit (tree sites) cluster for additional information.	
/13020AA	Lettuce		300 ppm (in combination with chloropicrin) Preplant soil fumigation through 400 pounds per acre. Do not make more than 1 application in 2 to 3 years. Use limited to CA.
FVLBVVA	Lettuce big vein	200-300 lb/A (67%, 75%, 80%, 99.5%, PrGs)	Preplant soil fumigation.
NABAAAA PAAAAAA	Nematodes Weeds	300-400 lb/A (67%, 75%, 80%, 99.5% PrGs)	

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/10001AA	Melons		40 ppm (for muskmelon; in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
		Refer to Broccoli cluster.	
	Nut Crops, Nut Trees (including Almond and Walnut)		See Citrus Fruit (tree sites) cluster.
/14011AA	Onions (Direct Seeded)		300 ppm (in combination with chloropicrin) Do not make more than one application per year. Preplant soil application through 300 pounds per acre.
NABAAAA PAAAAAA FICRQBB	Nematodes Weeds White rot	300 lb/A (67%, 75%, 80% PrGs)	Use limited to areas west of Rocky Mountains. Preplant soil fumigation. In northern states, late summer or early fall treatments are best for soil to be planted for early spring crops.
/28017AA	Peppers		25 ppm (in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
		Refer to Broccoli cluster.	
/06013AA	Pineapple		25 ppm (in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
		Refer to Broccoli cluster.	

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/01016AA	Strawberry		25 ppm (in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
		Refer to Broccoli cluster.	
/11005AA	Tomato		40 ppm (in combination with chloropicrin) Preplant soil fumigation through 800 pounds per acre.
		Refer to Broccoli cluster.	

TERRESTRIAL NON-FOOD CROP

General Warnings and Limitations: See TERRESTRIAL FOOD CROP General Warnings and Limitations.

(Agricultural Crops)

/26003AA	Tobacco		
FIAHPCN FGATPDZ FGATVAK	Black shank Granville wilt. Verticillium wilt	19-28.5 lb/A [0.27-0.4 lb/100 ft row] (67% PrGs)	Preplant soil fumigation.
FKAAQBB	Damping-off (including Fusarium, Pythium and Rhizoctonia)	800 lb/A or 2 lb/100 sq.ft (98%, 99.5%, 100% PrGs)	Preplant soil fumigation of transplant bed.
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	165-872 lb/A (66%, 67%, 68.6%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Preplant soil fumigation of field and transplant bed.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Ornamental Plants and Forest Trees)		
	General Warnings and Limitations: For reasons not clearly understood, plant growth has occasionally been unsatisfactory following soil fumigation with methyl bromide on the following ornamental plants: conifers, salvia, snapdragon, carnation, multiflora roses, holly and certain other plants. Every grower should use methyl bromide on a small scale under his growing conditions for at least a full growing season before extensive use.		
/30000AA	Forest Trees		
FKAAQBB	Damping-off (including Fusarium, Pythium and Rhizoctonia)	800 lb/A or 2 lb/100 sq.ft (98%, 99.5%, 100% PrGs)	Preplant soil fumigation of transplant bed.
NABAAAA	Nematodes	150-500 lb/A (43%, 50%, 57%, 66%, 67%, 68.6%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Preplant soil fumigation. Seeds of certain weeds such as clover, morning glory, filaree and others with hard seeds may require a higher dosage or a longer exposure period for effective control.
FKADQBB	Soilborne fungi		
IMAAAJA	Soilborne insects		
PAAAAAA	Weeds		
/33001AA	Ornamental Lawns		
/33008AA	Ornamental Turf		Treatments and dosages described below can be used for turf renovation. Work up the turf before fumigating. Undisturbed turf may be killed by fumigation and the dead sod sprigged or seeded after removal of the cover. Frequent sprinkling after seeding will insure a uniform stand.
/67002OA			
FKAAQBB	Damping-off (including Fusarium, Pythium and Rhizoctonia)	800 lb/A or 2 lb/100 sq.ft (98%, 99.5%, 100% PrGs)	Preplant soil fumigation.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Ornamental Lawns cluster (continued)		
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	165-500 lb/A (43%, 57%, 66%, 67%, 68.6%, 70%, 75%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs) or 1 lb/100 sq.ft (98%, 99.5%, 100% PrGs)	
/32000AA /32000DA /31000AA /34004AA	Ornamental Plants (including nursery stock)		
FKAAQBB	Damping-off (including Fusarium, Pythium and Rhizoctonia)	800 lb/A or 2 lb/100 sq.ft (98%, 99.5%, 100% PrGs)	Preplant soil fumigation of transplant bed.
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	150-500 lb/A (33%, 43%, 45%, 50%, 57%, 66%, 67%, 68.6%, 70%, 75%, 80%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 100% PrGs) or 1 lb/100 sq.ft (98%, 99.5%, 100% PrGs)	Preplant soil fumigation. Seeds of certain weeds such as clover, morning glory, filaree and others with hard seeds may require a higher dosage or a longer exposure period for effective control.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Ornamental Plants (including nursery stock) (continued)		
/31000AA /34004AA	(Herbaceous Perennials) (Ornamental Woody Shrubs)		
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	300-600 lb/A or 0.75-1 lb/100 sq.ft [tree site] (68.6%, 75%, 98%, 99.5%, 100% PrGs)	Preplant soil fumigation. In colder climates, treat in fall and plant following spring. In warmer climates, do not plant until 30 days after application.

(General Soil Treatment and Composting)

General Warnings and Limitations: Fumigation should take place outdoors or in a well ventilated area away from desired plants or occupied buildings. The material to be treated should have a temperature of 60 F (15.6 C) or above, be loose, and moist enough for good seed germination. To insure a good seal, pile the material to a depth of 19 inches on a concrete floor or on wet ground. Piles 2 to 3 feet high can also be treated provided perforations are made in the pile surface at one foot intervals to assist penetration. Once the pile has been made, install supports to hold the cover a few inches above the pile surface to aid in proper fumigant diffusion. Place the outlet of the applicator tube or tubes in evaporating pans spaced about 30 feet apart on the pile surface. Cover with a polyethylene sheeting or other gas confining material of 4 mil or greater thickness. Seal the edges by burying, covering with moist sand or soil or by means of sand snakes. Introduce the fumigant into the evaporating pans as a liquid or by means of the hot gas method. Aerate for 24 to 72 hours before planting.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/400000A /400030A /40001KA	Bulk Soil (Potting Soil, Top Soil) Compost Piles Manure		
FKAAQBB	Damping-off (including Fusarium, Pythium and Rhizoctonia)	1 lb/cu.yd (98%, 99%, 99.75%, 100% PrGs)	General soil fumigation. Preplant treatment of compost, manure, potting soil and top soil for use in transplant beds.
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	0.5-1 lb/cu.yd (98%, 99%, 99.75%, 100% PrGs)	General soil fumigation. Preplant treatment of compost, manure, potting soil and top soil for use in transplant beds.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Bulk Soil (Potting Soil, Top Soil) cluster (continued)		
		4 lb/100 cu.ft [injection point/100 cu.ft] (98%, 99%, 99.75%, 100% PrGs)	General soil fumigation of potting mixes in flats. Arrange the flats in loose criss-cross stacks no more than 5 feet high, then cover and seal. Introduce the fumigant into evaporating pans or by means of the hot gas method.
/40006KA	Mulch (Hay, Manure, Straw)		
			Straw or hay should be thoroughly soaked several days prior to treatment since seeds must be moist at time of fumigation for best results. At the time of treatment, the bales should be piled up and covered with a plastic cover with edges sealed in the same manner as recommended for soil.
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	1 lb/4 bales (98%, 99.5%, 100% PrGs)	Fumigation of mulches.
/400080A	Seed and Transplant Beds (nonfood)		
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	180-872 lb/A (33%, 45%, 50%, 57%, 66%, 67%, 68.6%, 70%, 75%, 80%, 88.2%, 98%, 99%, 99.5%, 99.65%, 99.75%, 99.8% 100% PrGs)	Preplant soil fumigation of seed and transplant beds.

Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations

(Noncrop, Wide Area, and General Indoor/Outdoor Treatments)

/670020A Recreational Areas (including Athletic Fields, Golf Courses and Parks)

Refer to (Ornamental Plants and Forest Trees), Ornamental Lawns cluster for use and limitation information.

GREENHOUSE FOOD CROP

General Warnings and Limitations: The use of methyl bromide in confined spaces presents a potential hazard to humans and plant life. Special precautions must be made in order that these potential hazards be minimized. It is the responsibility of the individual supervising the fumigation operation to see that all safety precautions below are strictly observed:

a) Before the fumigation operation commences, the supervisor of the fumigation job shall have conducted proper training of all personnel involved in the fumigation (includes use of safety equipment), removed all persons from the area not directly involved in the fumigation, and inspected the equipment to insure proper aeration.

b) If a wind is blowing, all injection should be made upwind from a previous injection site. Immediately after injection of the fumigant and tarping, a qualified person wearing protective equipment, should monitor the area with a halide leak detector. If excessive leaks are found, the source of the leak should be resealed immediately.

c) During this operation, all windows and doors should be open and fans operating to maximize ventilation. The fumigated area must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words, "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector. Exposure time should be 24 to 48 hours.

Refer to TERRESTRIAL FOOD CROP, General Warnings and Limitations for Soil Fumigation Methods.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Agricultural Crops)		
/11005CA	Tomato		40 ppm (in combination with chloropicrin) Preplant soil fumigation of greenhouse grown crop through 240 pounds per acre.
NABAAAA	Nematodes	165-240 lb/A or 9.5-13.8 lb/ 2500 sq.ft (66%, 98%, 99%, 99.5%, 99.65%, 99.75%, 100% PrGs)	Preplant soil fumigation of greenhouse grown crop.
FKADQBB	Soilborne fungi		
IMAAAJA	Soilborne insects		
PAAAAAA	Weeds		

GREENHOUSE NON-FOOD CROP

General Warnings and Limitations: Refer to GREENHOUSE FOOD CROP General Warnings and Limitations.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Agricultural Crops) (Ornamental Plants and Forest Trees)		
/28084CA	Nonfood/Nonfeed Crops (Greenhouses)		
NABAAAA	Nematodes	180-435 lb/A or 10.3-25 lb/ 2500 sq.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Preplant soil fumigation of nonfood/nonfeed crops grown in greenhouses.
FKADQBB	Soilborne fungi		
IMAAAJA	Soilborne insects		
PAAAAAA	Weeds		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	DOMESTIC OUTDOOR		
	(Household)		
/630030A	Domestic Dwellings (Outdoor)		
ISASAAA	Ants	1 lb/ant colony (98%, 100% PrGs)	Fumigation of ant colonies. Apply to individual mounds. Do not apply near fruit trees.
	(Wood or Wood Protection Treatment)		
/640040A	Wooden Plant Stakes		
NABAAAA FKADQBB IMAAAJA PAAAAAA	Nematodes Soilborne fungi Soilborne insects Weeds	3 lb/1,000 cu.ft (98%, 99.5%, 100% PrGs)	Fumigation of plant stakes for 'clean-up' prior to use. Treat under tarp. Allow a minimum exposure time of 48 hours. Consult local County Agricultural Extension Service for additional directions and instructions.

INDOOR

General Warnings and Limitations:
For structural fumigation: At temperatures below 60 F (15.6 C), increase the dosage by 0.5 pound per 1,000 cubic feet for every 10 F (5.6 C) drop in temperature or use an approved procedure to heat the fumigant. Do not fumigate when temperature is below 50 F (10.0 C).
Claims for control of stored product pests and structural pests will also control rats and mice. When rodenticide claim is solely the object of fumigation, dosages are usually lower.
Overdosing, overexposure or repeated fumigation of food or feedstuff commodity should be avoided. When the prior history is not known, or in those instances where a repeated fumigation is necessary, the commodity should be analyzed for inorganic bromide residues before fumigation to make certain the proposed treatment will not result in residues that will exceed the tolerances established. Special care must be exercised to determine that methyl bromide fumigation of commodities such as animal feeds, flour, dried eggs, dried figs, dried milk, nuts, meats and meat products will not result in residues in excess of established tolerances.
When used for fumigation of enclosed spaces, 2 persons trained in the use of methyl bromide must be present at all times during introduction of the fumigant, testing, and aeration periods.

Stored Commodity/Product Fumigation Methods:
Unless otherwise specified in the use paragraph, use 1 of the following methods.

General Warnings and Limitations (continued)

1. Chamber Fumigation
Load the chamber with the material to be fumigated, close exhaust ports, turn on circulating fan and close chamber door. Determine the proper rate of application and exposure time. Vaporize the liquid in the chamber by spraying it into the air stream in front of a blower or fan, passing it through a vaporizer, or allowing it to evaporate from a shallow pan.
Before introducing the fumigant, place warning signs and a red warning light on the door. Two people wearing full-faced gas masks with an approved black canister for organic vapors should be present when introducing the fumigant and opening the door after fumigation. All controls should be outside the chamber.
At the end of the exposure period, aerate by opening the exhaust port, turning on the exhaust fan and opening the chamber door slightly to permit fresh air to enter.
Always check completeness of aeration with detection devices before allowing unprotected persons to enter the chamber.

2. Vacuum Chamber Fumigation
   a) Place material to be fumigated in the steel chamber and draw the desired vacuum.
   b) Release fumigant into the chamber (usually through a heating unit to insure complete vaporization).
   c) At the end of the exposure time, release the vacuum and change the air in the chamber at least 2 times. A vacuum of 15 inch mercury should be drawn for this purpose.

3. Truck, Van or Trailer Fumigation - Closed Top Conveyances
   a. Seal the off-side door, ventilators and other openings from the inside.
   b. Use a closed-ended, perforated tube to distribute fumigant evenly. Secure the tube to the ceiling so the perforations direct fumigant toward the floor and prevent it from spraying the ceiling. Always apply fumigant from outside the truck, van or trailer.
   c. Seal the door and place warning signs on both sides of the truck, van or trailer. Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated," the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.
   d. Do not fumigate while strong winds are blowing.
   e. After 12 to 18 hours, open the unit and aerate 1 to 1.5 hours. The truck, van or trailer may then be resealed for shipment.
   f. Advise consignee to check the truck, van or trailer for proper aeration on arrival. Do not move trucks, vans or trailers during

General Warnings and Limitations (continued)

fumigation. They must be completely aerated before movement is allowed.

4. Truck, Van or Trailer Fumigation - Open Top Conveyances
    a) Park trailer or van out of traffic area—if possible on the lee side of a building to protect from winds.
    b) Roll back the protective tarpaulin to expose the bulk grain or other commodity.
    c) Prepare a gas expansion dome by placing several cardboard boxes, empty 5-gallon pails or other propping materials on the top of the load down the center line. These props should be high enough to support the tarpaulin 12 to 18 inches at the center line above the grain or commodity surface after replacement.
    d) Place 2 shallow, plastic or nonaluminum metal, containers on the center line grain surface of the load at points 0.3 and 0.6 the distance from the front of the conveyance. Direct into and firmly attach with tape 1 end of a 0.25 inch I.D. polyethylene applicator hose into each evaporating container to prevent liquid methyl bromide from contacting the commodity. Hang the other end of each hose over the side of the conveyance down to approximate waist height from the round. The ends of the hoses should have a brass fitting for attaching to the applicator.
    e) Pull the tarpaulin back over the load, covering the props thereby creating the gas expansion dome. Do not tie down the tarpaulin but leave sufficient room to tape the gasproof cover to the conveyance sides below the edges of the tarpaulin.
    f) With the 4 or 6 mil polyethylene or other gasproof cover, completely over-cover the protective tarpaulin to extend down the sides of the container. Clean the containers of dirt and grease. With two-inch masking tape, seal the entire edge of the gasproof cover to the sides and ends of the container, below the tarpaulin, leaving the ends of the 2 applicator hoses exposed for attaching the applicator.
    g) Do not occupy truck cabs, van cabs or trailer attached tractor cabs during exposure and aeration periods. Lock the tag cab doors during the exposure and aeration periods.
    h) CLEAR THE IMMEDIATE WORKING AREA OF ALL UNAUTHORIZED PERSONNEL. Release one-half of the recommended dosage through each of the applicator tubes, from the applicator. Methyl bromide boils at 39 F (3.8 C).
    i) Following release of the methyl bromide and disconnection from the applicator, tape the open end of the applicator hose with masking tape and fasten the hose to the side of the conveyance.
    j) Using a halide gas detector, check for fumigant leaks at all taped margins and at the floor of the conveyance. Seal any point where flame color readings from the faint green to blue-green indicate methyl bromide leakage.

General Warnings and Limitations (continued)

k) Securely attach the proper methyl bromide fumigation warning placards to each side and to the ends of the conveyance during the fumigation and aeration period.

l) Do not move the vans, trucks and trailers during the exposure period of 12 to 24 hours. At the end of the exposure period, working in a well-ventilated area and from ground level only, unseal the taped edges and remove the gasproof cover. Also working from ground level only, starting with the downwind end first, peel back the protective tarpaulin cover toward the center of the container to expose the commodity load surface at each end. Do not remove warning placards until aeration has been completed. UPON COMPLETION OF THE AERATION PROCEDURE, THE PROFESSIONAL FUMIGATOR IS RESPONSIBLE FOR THE RELEASE OF THE CONVEYANCE AND COMMODITY.

5. Railroad Car Fumigation

a) Car should be placed on seldom used trackage or siding so that it will not have to be moved while under fumigation.

b) Methyl bromide must always be applied from outside the railroad car by means of a 0.25 inch copper or plastic tubing attached to a special can puncturer or to a methyl bromide cylinder. The tube may be introduced into the car through a hole drilled in the floor near the center of the car or through some other convenient hole such as a crack in the door or some roof opening. The discharge end of the tube should be secured near the ceiling at the center of the car. This may be accomplished by fastening the tube to a pole, stick or some other support that may be propped up to hold the end of the tube near the ceiling. The discharge end of the tube is plugged and a hole drilled through the opposite walls or the tube about 1 to 2 inches below the tip to permit escape of the methyl bromide mist above the commodity load and toward the opposite ends of the car.

c) All car openings should be carefully sealed. Particular attention should be given the space around doors, the eaves, and the floor. During application and fumigation, all openings used to introduce the gas tube should be tightly sealed up to and surrounding the tube. Any holes bored through the car structure should be of a minimum size and carefully sealed following fumigation. Masking tape, caulking compound or greased paper may be used as sealing materials.

d) Post warning signs conforming to Department of Transportation regulations on both doors before applying methyl bromide.

e) Methyl bromide may be applied by using special measuring devices that can be attached to the cylinders. Always wear safety glasses when working with methyl bromide.

f) After application of the proper dosage, withdraw the tubing and seal the hose used for application. Keep the car sealed for 12 to 18 hours. A halide detector may be used to check sealed areas

General Warnings and Limitations (continued)

for leaks. The fumigated car should not be moved during the exposure period.

g) At the end of the fumigation period, open all doors and vents to allow as much air circulation as possible. It will usually require about 30 minutes to aerate a car after fumigation but this must be determined by the use of a halide detector. Keep all persons out of the car during fumigation and aeration and until such time as the halide detector shows no methyl bromide present. Only then is it safe to enter the car without wearing respiratory protection.

6. Grain Elevator Fumigation

The recirculation method is best for grain elevator fumigation since it allows more time for gas penetration in high resistance areas.

a) Seal structure carefully, using masking tape for small openings and polyethylene sheeting secured with masking tape for large openings.

b) Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.

c) Use the rate and exposure time shown in site entries for specific grains to be treated.

d) Fumigate by using a fan or blower to recirculate the methyl bromide through the perforated pipes or ducts at the bottom of the bin, up through the return duct. Or discharge the fumigant through polyethylene tubing in the head space at intervals of 100 feet or less.

e) Check periodically for leaks with a halide gas detector.

f) To aerate after fumigation, disconnect return air at the fan and discharge into outside air. Continue aeration until halide detector shows the fumigant has dissipated. Use halide detector to check the elevator head space for possible pockets of methyl bromide.

7. Tarpaulin Fumigation

a) Arrange the stacks, gas expansion dome, tubing and evaporating pans and tarpaulin. Follow these directions:

The stack: Stacks of stored commodities usually can be fumigated where they stand as long as the tarpaulin is large enough to cover the stack completely. Be sure to allow for a tarpaulin margin of at least 2 feet around the stack when the cover is laid over it. The stack should be on a concrete floor or other airtight surface. Where floors are not airtight (such as on a loading dock) cracks

General Warnings and Limitations (continued)

should be caulked or otherwise sealed to prevent escape of the fumigant. Sisal kraft paper, tar paper, or additional tarpaulin laid on the floor under the material to be fumigated will provide a satisfactory seal.

The gas expansion dome: Center 4 or more sacks upright on top of the stacked material to form a gas expansion dome. This facilitates gas distribution.

The tubing and evaporating pans: Copper, polyethylene, or saran tubing is used to inject the gas near the center of the expansion dome. The outlet of this tubing should be fastened to an evaporating pan to prevent liquid methyl bromide from dripping on the commodity being fumigated, or splashing on the tarpaulin.

The tarpaulin: Polyethylene or gas proof, impregnated, tarpaulins should be used. Water-proofed canvas tarpaulins are not satisfactory. Before spreading the tarpaulin, sweep around the stack to provide a clean surface for sealing. Unroll or unfold the tarpaulin over the stack, providing a margin on the floor of 2 or feet. Run the applicator tubing out from under the tarpaulin at a corner, which should be folded. Seal the tarpaulin by weighting it down with a row of bagged material or sand-filled tubes. (Canvas or plastic tubing about 4 inches in diameter may be used for these sandsnakes.)

b) Once the above preparations are completed, fumigation can be done. Attach the applicator tubing to the cylinder of methyl bromide. Place warning placards on tarpaulins under fumigation. These place cards must be present during aeration. Leave the stack undisturbed for 24 hours after releasing the fumigant.

8. Shipboard, In Transit or Shiphold Fumigation

Shipboard, in transit ship or shiphold fumigation is also governed by United States Coast Guard Regulations. Refer to and comply with these regulations prior to fumigation.

Prefumigation Procedures

a) Prior to fumigating a vessel for in transit cargo fumigation, the master of the vessel or his representative, and the fumigator must determine whether the vessel is suitably designed and configured so as to allow for safe occupancy by the ship's crew throughout the duration of the fumigation. If it is determined that the design and configuration of the vessel does not allow for safe occupancy by the ship's crew throughout the duration of the fumigation, then the vessel will not be fumigated unless all crew members are removed from the vessel. The crew members will not be allowed to reoccupy the vessel until the vessel has been properly aerated and a determination has been made by the master of the vessel and the fumigator that the vessel is safe for occupancy.

b) The person responsible for the fumigation must notify the master of the vessel, or his representative, of the requirements relating

General Warnings and Limitations (continued)

to personal protection equipment, detection equipment and that a person qualified in the use of this equipment must accompany the vessel with cargo under fumigation. Emergency procedures, cargo ventilation, periodic monitoring and inspections, and first aid measures must be discussed with and understood by the master of the vessel or his representative. Personal protection equipment means a self contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator approved jointly by the National Institute of Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA).

c) Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.

d) During the fumigation or until a manned vessel leaves port or the cargo is aerated, the person in charge of the fumigation shall insure that a qualified person using gas or vapor detection equipment tests spaces adjacent to spaces containing fumigated cargo and all regularly occupied spaces for fumigation leakage. If leakage of the fumigant is detected, the person in charge of the fumigation shall take action to correct the leakage, or shall inform the master of the vessel, or his representative of the leakage so that corrective action can be taken.

e) If the fumigation is not completed and the vessel aerated before the manned vessel leaves port, the person in charge of the vessel shall insure that at least 2 units of personal protection equipment and 1 gas or vapor detection device, and a person qualified in their operation be on board the vessel during the voyage.

Precautions and Procedures During Voyage

Using appropriate gas detection equipment, monitor spaces adjacent to areas containing fumigated cargo and all regularly occupied areas for fumigant leakage. If leakage is detected, the area should be evacuated of all personnel, ventilated, and action taken to correct the leakage, before allowing the area to be occupied. Do not enter fumigated areas except under emergency conditions. If necessary to enter a fumigated area, appropriate personal protection equipment must be used. Never enter fumigated areas alone. At least 1 other person, wearing personal protection equipment, should be available to assist in case of an emergency.

Precautions and Procedures During Discharge

If necessary to enter holds prior to discharge, test spaces directly above grain surface for fumigant concentration, using appropriate gas

Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations

General Warnings and Limitations (continued)

detection and personal safety equipment. Do not allow entry to fumigated areas without personal safety equipment, unless fumigant concentrations are at safe levels, as indicated by a suitable detector.

9. Warehouse, Structural and Food Plant Fumigation
Check with appropriate municipal and county authorities before fumigating to be completely familiar with local regulations. Ordinances may require watchmen, padlocks, or warning posters during and after fumigation and/or notification of the nearest fire station. Notify anyone who would normally be in the area before fumigating. Several types of buildings can be fumigated with methyl bromide. Frame, metal and concrete buildings used for storage of agricultural products can be fumigated if they are in good repair and tight, or can be made tight by sealing or tarping. The buildings include packing plants, grain elevators, milling and baking plants, port warehouse grain storage buildings, coffee warehouses. Cement blocks pose a special problem because of their porous nature, but can be fumigated if an increased dosage and exposure time is allowed to compensate for the diffusion loss. There is no rule of thumb allowing for leakage. The applicator will have to exercise judgement from his observation of the building's condition.

a) The most important part of the entire fumigation job lies in the preparation and sealing of the structure.
The properties of penetration and diffusion that make methyl bromide an ideal fumigant also make it difficult to confine—and for that reason, a good sealing job is necessary. High winds, for example, increase fumigant loss and cause fumigant to drift to the leeward side of the building.
Sealing of the building begins with the closing of all external openings to the building. Seal roof ventilators and chimneys by wrapping them with tarpaulin, or plastic sheet, or by stripping the screened openings with a wide commercial masking tape.
Stairwells and interior doors should be closed. Any broken panes should be replaced, then exterior doors and windows should be wedged tight, locked, and cracks caulked or taped. Check for cracks in the floor, roof, and around eaves and seal them.
Special care should be taken to seal partitions to adjacent storage or work areas in a building. Adjoining buildings sharing a common wall must be cleared of personnel, animals, and items that will react to methyl bromide or commodities which might be damaged by exceeding the established tolerances for inorganic bromide, before fumigation. If this is not feasible, spread a glossy type building paper, Sisalkraft or asphalt laminated paper, plastic film, or a heavily oiled kraft or wrapping paper to prevent spread of the fumigant into undesired areas. In all such cases where the adjoining building is occupied, it should be checked frequently with a halide detector during fumigation to insure the safety of

General Warnings and Limitations (continued)

the occupants. Check local regulations for specific requirements. Appearance, economy and ease of cleanup will probably determine your choice of sealing materials.

Where time and neatness are factors, masking tapes and commercial caulking compounds will probably justify their extra cost. It is possible, however, to make your own paste by combining lubricating oil and a low grade of flour.

Because methyl bromide gas can penetrate accumulations of trash and sweepings, necessary cleanups may be postponed until after the fumigation has been completed. It is recommended that all doors and hatches on milling machinery be opened. These include elevator boots and repair openings, conveyor lids, settling chamber doors and dust trunks. This also applied to reels, purifiers, sifters, shorts and bran dusters, feeder gates on rolls and purifiers as well as other openings that will facilitate the entrance of gas to the equipment. Dead spouts are particularly difficult to penetrate and should be opened before the fumigation.

b) Dosage recommendations are made on the basis of cubic content. In square or rectangular buildings simply multiply the interior length by width by height. In irregular shaped buildings, find the cubic content of each unit, then add them together to find the total. In the case of peaked roofs, the average height between sidewall and the top of the roof may be used as the third multiple in calculating the cubic content.

In taking measurements, no deductions should be made for space occupied by machinery, commodities or furnishings. Exceptions to this rule apply to fresh fruits and vegetables.

c) Cylinders should be placed by a two-man team, using a clipboard to map the location of each cylinder in the building. The cylinders should be arranged so that the fumigator will start releasing the gas on the top floor and continue walking away from the released gas in the direction of the exit as he opens each subsequent cylinder.

As methyl bromide is heavier that air, it is advisable to overdose the top floor slightly. In all cases, the size of cylinder can quite naturally follow the needed dosage for that particular cubic space. Cylinders should be located within a room so as to do the best job of diffusion into all areas. Cylinders should be set in an upright position and the shipping caps removed. Again, since methyl bromide is heavier than air, in order to prevent stratification at the lower levels, it is sometimes advisable to attach standpipes (or curved pipes directed upward) to the cylinder valves. If standpipes are used, they should be equipped with T fittings to direct the gas laterally and prevent direct contact.

General Warnings and Limitations (continued)

d) At this point, a practice session should be undertaken to familiarize the operators with the location of each cylinder and the sequence in which it is to be discharged. With gas masks at ready position, quickly open and close the cylinder valves to make certain they are in working order and thus avoid delay during the actual release.
If fans are to be used, they should be strategically located and made ready to switch on or off from outside the building. One 16 inch fan for every 50,000 cubic feet of space will be sufficient. Quite often, however, it is possible to use heating fans or other installations already in the building.
Extinguish all open flames and turn of all high temperature electrical equipment including laboratory ovens, pilot lights, gas refrigerators, oil burners, etc. Presence of intense heat from such sources may change methyl bromide to hydrobromic acid which may be injurious to commodities and equipment.
Place warning signs on all entrances to the building. Have lights to illuminate warning signs plainly. Inform police, fire and health officials that a fumigation process is about to begin. Observe location of nearest telephone for use in case of emergency.
Make sure fumigators can recognize early symptoms of methyl bromide intoxication and that the appropriate physicians and hospitals have been provided a copy of "First Aid & Treatment for Methyl Bromide Exposure".
Arrangements should be made to seal and bar the building entrances as soon as the job is complete. Watchmen should take up their stations to prevent any admittance during the fumigation.

e) At this point, gas masks should be donned, carefully checked, and the cylinders opened. Under no circumstances should the operators be in the building longer than 30 minutes in releasing the gas. If it is impossible for 1 crew to do it within this time period, additional experienced crews should be used. Two persons trained in the use of methyl bromide must be present at all times during introduction of the fumigant, testing, and aeration periods. Thus, in case 1 should become incapacitated for any reason, such as an accidental fall that would result in an injury or unconsciousness, the other man could remove him to fresh air. These men should always remain close to each other from the time they open the first cylinder until the time they leave the building together. While the first 2 are in the building, it is advisable to have 2 additional men, with gas masks ready, waiting at the exit to aid if needed. When releasing fumigant, start on the top floor and work toward exits. Where there is a basement, the gas should be released there immediately prior to releasing the gas on the ground floor. One man should check off locations of each cylinder so none are missed.

General Warnings and Limitations (continued)

All fans should be running while the gas is being released and left running until uniform distribution has been accomplished, which should not require more than 30 minutes to 1 hour. After this the fans should be turned off.

f) Once the exposure period is complete, aeration should be started by opening the previously prepared doors and windows on the ground floor. Where ventilators are accessible from the outside they should also be opened at this time. The ground floor should be allowed to aerate until a halide leak detector shows that the methyl bromide concentration has diminished to the point where the detector shows no more than dark green. At this point, at least 2 men, wearing gas masks, should begin opening windows, starting at the bottom and working upward. These men should not try to open all windows on any single floor the first time through but should open only those windows that are necessary for thorough ventilation and return to the outside as soon as possible. They should not remain inside the building for prolonged periods (not more than 15 minutes). The fans should be turned on once again and allowed to run until aeration is complete. After the building has been partially aerated, the men, again wearing masks, should open as many of the remaining windows as needed to complete the aeration. No one should be allowed inside the building without a gas mask until all parts of the building have been checked with a halide detector for methyl bromide concentration and the flame shows no change in color at any point. Once the aeration has been completed, usually in 2 or 3 hours, the building can be returned to normal condition for operation. Where possible, it is advisable to leave in place such sealing as will not hinder aeration and operations so that this sealing does not have to be replaced for future fumigations.

10. Recirculation Method
With recirculation, dosages can be reduced as much as 50 percent to 70 percent below those recommended because of more efficient use of the fumigant. Bulletins are available for dose and use recommendations.

Exposure Period for Stored Commodity Fumigation:
Unless otherwise specified, expose the treated commodities for a period of 12 to 24 hours.

(Agricultural Crops)

General Warnings and Limitations: Fumigation of stored grain with moisture content above 14 percent may injure germination. Do not fumigate if grain moisture is high or if grain temperature is below 60 F (15.6 C) or if there is excessive dockage.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/23001EA	Alfalfa (Hay)		50 ppm Stored commodity fumigation through 3 pounds per 1,000 cubic feet.
INASBWA INAMCMA	Alfalfa weevil Cereal leaf beetle	3 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 24 hours.
IMAAAFA	Stored product insects	2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 16 to 24 hours.
/03001EA	Almond		200 ppm Stored commodity fumigation through 3.5 pounds per 1,000 cubic feet.
/03002EA	Brazil Nut		
/03010EA	Butternut		
/03003EA	Cashew		
/03004EA	Chestnut		
/03005EA	Filbert (Hazelnut)		
/03007EA	Macadamia Nut (Bushnut)		
/28015EA	Peanuts		
/03008EA	Pecan		
/03011EA	Pistachio		
/03009EA	Walnut		
IMAAAFA	Stored product insects	1-3.5 lb/ 1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation.
/03004EA	(Chestnut)		
IMAAAFA	Stored product insects	3.5 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 24 hours.
/28015EA	(Peanuts)		
VKGAAAA	Rodents	0.25 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/04001EA /04003EA /04004EA /05001EA /05002EA /05003EA /05004EA /05005EA	Apple Pear Quince		5 ppm Postharvest commodity fumigation through 5 pounds per 1,000 cubic feet.
INASECA	Apple curculio	5 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
IOBMAQA	Apple maggot		
ILAVACA	Brown mite		
IOBMALA	Cherry fruit fly		
ITBGAZA	Codling moth		
IRACCUA	Green peach aphid		
IOBMADA	Mediterranean fruit fly		
IOBMAEA	Melon fly		
IOBMAFA	Oriental fruit fly		
ITBGAQA	Oriental fruit moth		
IRAAABA	Scales		
IMOAAAA	Thrips		
IZZZDMA	Twig borers		
/05001EA	Apricot		20 ppm Postharvest commodity fumigation through 5 pounds per 1,000 cubic feet.
		Refer to Apple cluster.	
/14009EA	Artichoke (Jerusalem)		30 ppm Postharvest commodity fumigation through 3.5 pounds per acre.
ITBCCFA	Armyworm	3.5 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INBGAAA	Blister beetles		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28063EA	Barley		50 ppm Stored commodity fumigation through 6 pounds per 1,000 cubic feet.
INATANA	Khapra beetle	6 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours. Use in accordance with the plant quarantine program of the United States Department of Agriculture.
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (99%, 100% PrGs)	Stored commodity fumigation. Expose for 16 to 24 hours.
IMAAAFA	Stored product insects	3-4 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
		5-6 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours.
/15027EA	Beans		50 ppm (for beans, green beans, lima beans and snap beans) Postharvest commodity fumigation through 3.5 pounds per acre.
ITBMALA	Almond moth	3 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours.
INAGAGA	Cowpea weevil		
ITBCCFA	Armyworm	3.5 lb/1,000 sq.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 24 hours.
INAMARA	Bean leaf beetle		
INBGAAA	Blister beetles		
ITBCBOA	Corn earworm		
INAGAGA	Cowpea weevil		
INAMACA	Cucumber beetles (including Diabrotica beetle)		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
ITBMCCA	European corn borer		
INBPAZA	Japanese beetle		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Beans (continued)		
	Pest list continued from previous page.		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
INAPAFA	Mexican bean beetle		
IMOCAVA	Onion thrips		
ITBMAWA	Pickleworm		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs (including green stink bug)		
IJDAAAA	Symphylans		
IMAAAFA	Stored product insects	1-2 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/28002EA	Beets (Roots)		30 ppm (roots, garden and sugar)
/28020EA	Sugar Beets		Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INBGAAA	Blister beetles		
IOACADA	Cabbage maggot		
INAMACA	Cucumber beetles		
IMDAAAA	Earwigs		
ITBMCCA	European corn borer		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IRACAOA	Melon aphid		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
	Brazil Nut		See Almond cluster.
	Butternut		See Almond cluster.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/13007EA	Cabbage		50 ppm Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	4 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours. Use in accordance with the plant quarantine program of the United States Department of Agriculture.
INBGAAA	Blister beetles		
IOACADA	Cabbage maggot		
INAMCFA	Colorado potato beetle		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles (including Diabrotica beetle)		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IMOCAVA	Onion thrips		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs (including green stink bug)		
IJDAAAA	Symphylans		
/10002EA	Cantaloupe		20 ppm Postharvest commodity fumigation through 2.5 pounds per 1,000 cubic feet.
/10005EA	Honeydew Melons		
/10006EA	Muskmelons		
/10011EA	Pumpkins		
/10008EA	Watermelons		
/10010EA			
ITBCCFA	Armyworm	2.5 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
INBGAAA	Blister beetles		
INAMACA	Cucumber beetles (including Diabrotica beetle)		
INBUAAA	Darkling beetles		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRACADA	Melon aphid		
IMOCAVA	Onion thrips		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cantaloupe cluster (continued)		
	Pest list continued from previous page.		
ITBMAWA	Pickleworm		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAGAFA	Squash bug		
ITBQADA	Squash vine borer		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/28073EA	Carrots		30 ppm Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	4 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INBGAAA	Blister beetles		
IOBBABA	Carrot rust fly		
INAMACA	Cucumber beetles		
INBUAAA	Darkling beetles		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IMOCAVA	Onion thrips		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
	Cashew		See Almond cluster.
/05002EA	Cherry		20 ppm Postharvest commodity fumigation through 5 pounds per 1,000 cubic feet.
		Refer to Apple cluster.	
	Chestnut		See Almond cluster.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28026EA	Citron		30 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
INBGAAA	Blister beetles		
INAMACA	Cucumber beetles		
INBUAAA	Darkling beetles		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRACAOA	Melon aphid		
ITBMAWA	Pickleworm		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAGAFA	Squash bug		
ITBQADA	Squash vine borer		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/07001EA	Cocoa Beans		50 ppm Stored commodity fumigation through 1.5 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	1.5 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Apply by chamber fumigation. Expose for 12 hours.
/28006EA	Corn		50 ppm (corn and sweet corn, kernel plus cob with husk removed). Stored commodity fumigation through 6 pounds per 1,000 cubic feet.
INATANA	Khapra beetle	6 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours. Use in accordance with the plant quarantine program of the United States Department of Agriculture.
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (99%, 100% PrGs)	Stored commodity fumigation. Expose for 16 to 24 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Corn (continued)		
IMAAAFA	Stored product insects	2 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
		4 lb/1,000 cu.ft (98% PrGs)	Stored commodity fumigation. Expose for 12 hours.
/15004EA	Corn, Pop		240 ppm Stored commodity fumigation through 1.5 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	1.5 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation.
/15005EA	Corn, Sweet		50 ppm (corn and sweet corn, kernel plus cob with husk removed) Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INAMARA	Bean leaf beetle		
INBGAAA	Blister beetles		
IOACADA	Cabbage maggot		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
ITBMCCA	European corn borer		
IQALAHA	False chinch bug		
IQAQACA	Green stink bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IIFAAEA	Sowbugs		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Corn, Sweet (continued)		
	Pest list continued from previous page.		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs (including green stink bug)		
IJDAAAA	Symphylans		
/28007EA	Cotton (including Baled Cotton)		200 ppm (cottonseed) Stored commodity fumigation through 4.5 pounds per 1,000 cubic feet.
VKDAAAA	Bats	0.25 lb/1,000 cu.ft (98% PrGs)	Stored commodity fumigation. Expose for 6 hours.
VKCCAAA	Moles		
VKGAAAA	Rodents		
INASAHA	Boll weevil	3 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Apply by atmospheric fumigation. Expose for 24 hours.
ITAMAOA	Pink bollworm		
		4 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Apply by vacuum chamber fumigation. Expose for 2 hours with a sustained vacuum of 25 to 27 inches (equivalent to a barometric pressure of 3 to 5 inches mercury).
IMAAAFA	Stored product insects	2.25-4.5 lb/1,000 cu.ft [less than 100,000 cu.ft] or 1.875-2.25 lb/1,000 cu.ft [100,000-500,000 cu.ft] (98% PrGs) or	Stored commodity fumigation in warehouses. Decrease the dosage by 33 percent when treating unbaled cotton. Expose for 24 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cotton (continued)		
		1.5-1.875 lb/ 1,000 cu.ft [500,000- 1,000,000 cu.ft] or 1.5 lb/1,000 cu.ft [over 1,000,000 cu.ft] (98% PrGs)	
/27003EA	Cottonseed		200 ppm (cottonseed) Stored commodity fumigation through 8 pounds per 1,000 cubic feet.
INASAHA	Boll weevil	8 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. For Khapra beetle and pink bollworm, use in accordance with the plant quarantine program of the United States Department of Agriculture. Expose for 24 hours.
INATANA	Khapra beetle		
ITAMAWA	Pectinophora caterpillars		
INARAGA	Sawtoothed grain beetle		
ITAMAOA	Pink bollworm		
INABADA	Cigarette beetle	4 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Apply by tarpaulin fumigation. Expose for 24 hours.
ITBMCHA	Indianmeal moth	3 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Apply by vacuum chamber fumigation. Expose for 24 hours.
/10010EA	Cucumber		30 ppm Postharvest commodity fumigation through 2.5 pounds per 1,000 cubic feet. Expose for 4 hours.

Refer to Cantaloupe cluster.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/11001EA /11005EA	Eggplant Tomato		20 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INBGAAA	Blister beetles		
INAMCFA	Colorado potato beetle		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles (including Diabrotica beetle)		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
ITBMCCA	European corn borer		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IMOCAVA	Onion thrips		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
	Filbert (Hazelnut)		See Almond cluster.
/14007EA	Garlic		50 ppm Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
ILAVAUA	Brown wheat mite	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
ITAIAFA	Dyspessa ulula		
INASHIA	Garlic beetle		
IOACACA	Onion maggot		
IMOCAVA	Onion thrips		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/02002EA	Grapefruit		30 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet. Varietal tolerances may vary. Check with authorities prior to fumigation.
/02003EA	Kumquat		
/02004EA	Lemon		
/02005EA	Lime		
/02006EA	Orange		
/02007EA	Tangelo		
/02008EA	Tangerine		
ISASAAA	Ants	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
IRACAAA	Aphids		
ILAUAFA	Brevipalvus mites		
ITBHAHA	California orange-dog		
IOBMAUA	Carribean fruit fly		
INAVAWA	Conoderus wireworms		
IQAGAEA	Leaffooted bug		
IMAAAEA	Leafrollers		
INASHJA	Listroderes weevils		
IRAWAAA	Mealybugs		
INASHNA	Megalometis weevils		
IOBMABA	Mexican fruit fly		
INASHOA	Naupactus weevils		
ITBUALA	Orange tortrix		
ITBUEKA	Proculia moths		
ILAVAAA	Spider mites		
IMOAAAA	Thrips		
IOBMACA	West Indian fruit fly		
IRABAAA	Whiteflies		
/01014EA	Grapes		20 ppm Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet. Varietal tolerances may vary. Check with authorities prior to fumigation.
ISASAAA	Ants	4 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
IRACAAA	Aphids		
ILAUAFA	Brevipalvus mites		
ITBHAHA	California orange-dog		
IOBMAUA	Carribean fruit fly		
IMAAAEA	Leafrollers		
IQAGAKA	Leptoglossus bugs		
IRAWAAA	Mealybugs		
IOBMABA	Mexican fruit fly		
ITBUALA	Orange tortrix		
ILAVAAA	Spider mites		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Grapes (continued)		
	Pest list continued from previous page.		
IMOAAAA	Thrips		
IOBMACA	West Indian fruit fly		
IRABAAA	Whiteflies		
	Honeydew Melon		See Cantaloupe cluster.
/14008EA	Horseradish (Roots)		30 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
INASGGA	Imported crucifer weevil	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
	Kumquat		See Grapefruit cluster.
	Lemon		See Grapefruit cluster.
	Lime		See Grapefruit cluster.
	Macadamia Nut (Bushnut)		See Almond cluster.
	Muskmelons		See Cantaloupe cluster.
/05003EA	Nectarine		20 ppm Postharvest commodity fumigation through 5 pounds per 1,000 cubic feet.
		Refer to Apple cluster.	
/28062EA /28072EA /28071EA /28065EA	Oats Rice Rye Wheat		50 ppm Stored commodity fumigation through 6 pounds per 1,000 cubic feet.
INATANA	Khapra beetle	6 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours. Use in accordance with the plant quarantine program of the United States Department of Agriculture.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Oats cluster (continued)		
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (99%, 100% PrGs)	Stored commodity fumigation. Expose for 16 to 24 hours.
IMAAAFA	Stored product insects	3 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/15015EA	Okra		30 ppm Postharvest commodity fumigation through 3.5 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3.5 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. For pink bollworm, use in accordance with the plant quarantine program of the United States Department of Agriculture. Expose for 2 hours.
INBGAAA	Blister beetles		
ITBCCSA	Cabbage looper		
INAMACA	Cucumber beetles		
IMDAAAA	Earwigs		
IQAQACA	Green stink bug		
INBPAZA	Japanese beetle		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IRACAOA	Melon aphid		
ITAMAOA	Pink bollworm		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/14011EA	Onion		20 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 6 hours.
INBGAAA	Blister beetles		
ITBCCSA	Cabbage looper		
INAMACA	Cucumber beetles		
IMDAAAA	Earwigs		
INBPAZA	Japanese beetle		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Onion (continued)		
	Pest list continued from previous page.		
IOACACA	Onion maggot		
IMOCAVA	Onion thrips		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/14011EA	Onion (Cipollini Bulbs)		50 ppm (cippolini bulbs) Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
INAMFBA	Exosoma lusitanicum	4 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
	Orange		See Grapefruit cluster.
/14012EA	Parsnip (Roots)		30 ppm (parsnip root) (turnip root) Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
/14019EA	Turnip (Roots)		
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INBGAAA	Blister beetles		
ITBCCSA	Cabbage looper		
IOACADA	Cabbage maggot		
IOBBABA	Carrot rust fly		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles		
INBUAAA	Darkling beetles		
IQAQACA	Green stink bug		
INBPAZA	Japanese beetle		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
INAPAFA	Mexican bean beetle		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/05004EA	Peach		20 ppm Postharvest commodity fumigation through 5 pounds per 1,000 cubic feet.
		Refer to Apple cluster.	
	Peanuts		See Almond cluster.
	Pear		See Apple cluster.
/28074EA	Peas		50 ppm (peas and blackeyed peas) Stored commodity fumigation through 4 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
INAMARA	Bean leaf beetle		
ITBCCSA	Cabbage looper		
INAMCFA	Colorado potato beetle		
IRBCBOA	Corn earworm		
INAGAGA	Cowpea weevil		
INAMACA	Cucumber beetles		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
IOAQACA	Green stink bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
INAPAFA	Mexican bean beetle		
IMOCAVA	Onion thrips		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/15007EA	(Peas, Dry)		
ITBMALA	Almond moth	3 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours.
INAGAGA	Cowpea weevil		
ITBMCHA	Indianmeal moth	2 lb/1,000 cu.ft (100% PrGs)	
IMAAAFA	Stored product insects	4 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 24 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Pecan		See Almond cluster.
/28017EA	Peppers		30 ppm
/11004EA	Pimento		Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	4 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
INBGAAA	Blister beetles		
ITB[illegible]	Cabbage looper		
INAMCFA	Colorado potato beetle		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles (including Diabrotica beetles)		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
ITBMCCA	European corn borer		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IRACAOA	Melon aphid		
IOBMATA	Pepper maggot		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/06013EA	Pineapple		20 ppm Postharvest commodity fumigation through 2 pounds per 1,000 cubic feet.
INBPAZA	Japanese beetle	2 lb/1,000 cu.ft (100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
IRAWAAA	Mealybugs		
IOBMAFA	Oriental fruit fly		
ILAVAAA	Spider mites		
	Pistachio		See Almond cluster.
/05005EA	Plum		20 ppm Postharvest commodity fumigation through 5 pounds per 1,000 cubic feet.

Refer to Apple cluster.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/14013EA /14018EA /14021EA	Potato Sweet Potato		75 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose potato for 6 hours and sweet potato for 4 hours.
INBGAAA	Blister beetles		
INAMCFA	Colorado potato beetle		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles (including Diabrotica beetles)		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRAWAAA	Mealybugs		
IMOCAVA	Onion thrips		
IRAXAHA	Potato psyllid		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
/05006EA	Prune		20 ppm (plums, fresh prunes) Postharvest commodity fumigation through 2 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	5 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
	Pumpkin		See Cantaloupe cluster.
	Quince		See Apple cluster.

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METHYL BROMIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/14014EA /14015EA	Radish Rutabaga		30 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose radish for 4 hours and rutabaga for 6 hours.
INBGAAA	Blister beetles		
IOACADA	Cabbage maggot		
ITBCBOA	Corn earworm		
INAMACA	Cucumber beetles		
INBUAAA	Darkling beetles		
IMDAAAA	Earwigs		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IRAWAAA	Mealybugs		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
	Rice		See Oats cluster.
	Rye		See Oats cluster.
/14016EA	Salsify (Roots)		30 ppm Postharvest commodity fumigation through 3 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	3 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 4 hours.
INAMADA	Flea beetles		
IRAFAAA	Leafhoppers		
IQAQAAA	Stink bugs		
IQAMATA	Tarnished plant bug		
/28019EA	Sorghum		50 ppm Stored commodity fumigation through 6 pounds per 1,000 cubic feet.
INATANA	Khapra beetle	6 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours. Use in accordance with the plant quarantine program of the United States Department of Agriculture.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Sorghum (continued)		
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (99%, 100% PrGs)	Stored commodity fumigation. Expose for 16 to 24 hours.
IMAAAFA	Stored product insects	4 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
		5-6 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 hours.
/10013EA /10014EA	Squash (Summer) Squash (Winter)		20 ppm (winter squash) 30 ppm (summer squash) Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
ITBCCFA	Armyworm	4 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 2 hours.
INBGAAA	Blister beetles		
INAMACA	Cucumber beetles (including Diabrotica beetles)		
INBUAAA	Darkling beetles		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRACADA	Melon aphid		
ITBMAWA	Pickleworm		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAGAFA	Squash bug		
ITBQADA	Squash vine borer		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/10015EA	Squash (Zucchini)		20 ppm Postharvest commodity fumigation. Expose for 3 hours.
ITBCCFA	Armyworm	2.5 lb/1,000 cu.ft (98%, 100% PrGs)	Postharvest commodity fumigation. Expose for 3 hours.
INBGAAA	Blister beetles		
INAMACA	Cucumber beetles (including Diabrotica beetles)		
INBUAAA	Darkling beetles		
IQALAHA	False chinch bug		
INBPAZA	Japanese beetle		
ITAAAOA	Loopers (including cabbage looper)		
IQAMARA	Lygus bugs		
IRACADA	Melon aphid		
ITBMAWA	Pickleworm		
IIFAAEA	Sowbugs		
ILAVAAA	Spider mites		
IQAGAFA	Squash bug		
ITBQADA	Squash vine borer		
IQAQAAA	Stink bugs		
IJDAAAA	Symphylans		
	Sugar Beets		See Beets (Roots) cluster.
	Sweet Potato		See Potato cluster.
	Tangelo		See Grapefruit cluster.
	Tangerine		See Grapefruit cluster.
/26003EA	Tobacco		N.F. Postharvest commodity fumigation through 4 pounds per 1,000 cubic feet.
VKDAAAA	Bats	0.25 lb/1,000 cu.ft (98% PrGs)	Stored commodity fumigation. Expose for 6 hours.
VKCCAAA	Moles		
VKGAAAA	Rodents		
INABADA	Cigarette beetle	2-3 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Apply by atmospheric fumigation. Expose for 48 to 72 hours.
INABAEA	Drugstore beetle		
ITBMBLA	Tobacco moth		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Tobacco (continued)		
		4 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Stored commodity fumigation. Apply by vacuum chamber fumigation. Expose for 4 hours with a sustained vacuum of 25 to 27 inches (equivalent to a barometric pressure of 3 to 5 inches mercury).
IMAAAFA	Stored product insects	2.25-4.5 lb/1,000 cu.ft [less than 100,000 cu.ft] or 1.5-2.25 lb/1,000 cu.ft [100,000-500,000 cu.ft] or 1.5-1.875 lb/1,000 cu.ft [500,000-1,000,000 cu.ft] or 1.5 lb/1,000 cu.ft [over 1,000,000 cu.ft] (98%, 100% PrGs)	Stored commodity fumigation in warehouses. Decrease the dosage by 33 percent when treating unbaled tobacco. Expose for 24 hours.
	Tomato		See Eggplant cluster.
	Turnips		See Parsnips cluster.
	Walnut		See Almond cluster.
	Watermelons		See Cantaloupe cluster.
	Wheat		See Oats cluster.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/14021EA	Yams		30 ppm Postharvest commodity fumigation through 3.5 pounds per 1,000 cubic feet.
		Refer to Potato cluster for use and limitation information.	
	(Processed or Manufactured Products, and Food or Feed Containers or Dispensers		
/46013EA	Airtight Chambers (Empty) (including Atmospheric Chambers, Vacuum Chambers and Fumigation Vaults)		
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (100% PrGs)	Fumigation of airtight chambers. Expose for 12 to 24 hours.
IMAAAFA	Stored product insects	1-3 lb/1,000 cu.ft (98%, 100% PrGs)	Fumigation of airtight chambers. Expose for 3 hours.
/44006EA	Burlap Bags (Empty)		
ITBMCHA	Indianmeal moth	3-4 lb/1,000 cu.ft (100% PrGs)	Fumigation of empty burlap bags. Expose for 24 hours.
INBEAFA	Lyctus beetles		
INAAACA	Powderpost beetles		
/43046EA	Candy (Processed)		125 ppm (processed food) Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
ITBMCHA	Indianmeal moth	1-2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours. Allow 24 hours for aeration.
INARAGA	Sawtoothed grain beetle		
/43002EA	Cereals (Processed)		125 ppm (processed food) Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	1-2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours. Allow 24 hours for aeration.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/43049EA	Cheese, Cheese Byproducts		325 ppm (parmesan and rouquefort cheese) Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
ILABAFA IOAZABA IMAAAFA	Cheese mite Cheese skipper Stored product insects	1-2 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/43024EA	Copra		100 ppm Stored commodity fumigation through 2.5 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	2.5 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 24 hours.
/43039EA	Dog Feed		400 ppm Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
INABADA ITBMCHA	Cigarette beetle Indianmeal moth	1-2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours. Allow 8 hours for aeration.
/43023EA	Eggs (Dried)		400 ppm Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
INATAKA	Larder beetle	1-2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/46034	Feed/Food Containers (Empty) (including Bags, Boxes and Crates)		
VKGAAAA	Rodents (including mice and rats)	0.25-0.31 lb/ 1,000 cu.ft (98%, 99%, 99.5%, 99.75%, 100% PrGs)	Fumigation of feed/food containers. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Feed/Food Containers (Empty) (including Bags, Boxes and Crates (continued)		
IMAAAFA	Stored product insects	1.5-3 lb/ 1,000/cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of feed/food containers. Apply by atmospheric fumigation. Expose for 24 hours.
		2-3 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of feed/food containers. Apply by vacuum chamber fumigation. Expose for 2 hours.
/43011EA	Flour (including Bagged Cereal Flour, Bakery Mixes and Cereal Flour)		125 ppm (processed food) Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	1-2 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/43026EA	Fruits (Dried) (including Apple, Apricot, Cherry, Date, Fig, Peach, Pear, Prune and Raisin)		125 ppm (processed food) 250 ppm (dried figs) Stored commodity fumigation through 1.5 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	1-1.5 lb/ 1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/46015EA	Grain Bins (Empty)		
VKGAAAA	Rodents (including mice and rats)	4-5 oz/1,000 cu.ft (98%, 99%, 99.5%, 99.75%, 99.8%, 100% PrGs)	Fumigation of empty grain bins. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	1.5-3 lb/1,000 cu.ft [less than 100,000 cu.ft] or 1.25-1.5 lb/1,000 cu.ft [100,000-500,000 cu.ft] or 1-1.25 lb/1,000 cu.ft [500,000-1,000,000 cu.ft] or 1 lb/1,000 cu.ft [over 1,000,000 cu.ft] (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of empty grain bins. Expose for 24 hours.
/43046EA	Grain Products (Processed)		125 ppm (processed food) Stored commodity fumigation through 2 pounds per 1,000 cubic feet.
IMAAAFA	Stored product insects	1-2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation of processed grain to be used in production of fermented beverage. Expose for 12 to 24 hours.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/43008EA	Herbs, Seasoning or Spices (Dried)		400 ppm (processed herbs and spices) Stored commodity fumigation through 3 pounds per 1,000 cubic feet.
VKGAAAA	Rodents	0.25 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	3 lb/1,000 cu.ft (98%, 100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/43047EA	Meat Products (including Cured Meat Products)		125 ppm (processed food) Stored commodity fumigation through 2 pounds per 1,000 cubic feet. Labeling claims for meat products include cured ham, bacon and sausage.
VKGAAAA	Rodents	0.25 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/46035EA	Nonfeed/Nonfood Containers (Empty) (including Bags, Boxes and Crates)		
IMAAAFA	Stored product insects	11 lb/1,000 cu.ft (98% PrGs)	Fumigation of empty nonfeed/nonfood containers. Expose for 24 hours.
/44010EA	Paper (Stored)		
VKDAAAA VKCCAAA VKGAAAA	Bats Moles Rodents	0.25 lb/1,000 cu.ft (98% PrGs)	Stored commodity fumigation. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Paper (Stored) (continued)		
IMAAAFA	Stored product insects	2.25-4.5 lb/ 1,000 cu.ft [less than 1,000 cu.ft] or 1.875-2.25 lb/1,000 cu.ft [100,000-500,000 cu.ft] or 1.5-1.875 lb/ 1,000 cu.ft [500,000-1,000,000 cu.ft] or 1.5 lb/1,000 cu.ft [over 1,000,000 cu.ft] (98% PrGs)	Stored commodity fumigation in warehouses. Expose for 24 hours.
/43027EA	Processed Foods		125 ppm Stored commodity fumigation through 2 pounds per 1,000 cu.ft.
IMAAAFA	Stored product insects	1-2 lb/1,000 cu.ft (100% PrGs)	Stored commodity fumigation. Expose for 12 to 24 hours.
/44006EA	Tarpaulins		
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	4 oz/1,000 cu.ft (100% PrGs)	Fumigation of tarpaulins. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	1-15 lb/1,000 cu.ft (100% PrGs)	Fumigation of tarpaulins. Expose for 24 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Agricultural Premises and Equipment)		
/61009EA	Barns		
ISASAAA	Ants	1-3.75 lb/ 1,000 cu.ft (98%, 99%, 99.5%, 99.75%, 100% PrGs)	Fumigation of barns. Apply the lower dosage for barns in good condition and the higher dosage for barns in unfavorable condition. Expose for 12 to 24 hours.
IQAFACA	Bed bug		
ISASAFA	Carpenter ants		
INATAFA	Carpet beetle		
ITBSABA	Clothes moth		
IVAAABA	Cockroaches		
INABAAA	Deathwatch beetle family		
INBEAFA	Lyctus beetles		
IJCAAAA	Millipedes		
INALANA	Oldhouse borer		
INAAACA	Powderpost beetles		
IMPBACA	Silverfish		
IKAAAAA	Spiders		
IMGAAAA	Termites (including dampwood and drywood termites)		
VKGAAAA	Rodents (including mice and rats)	0.25-0.31 lb/ 1,000 cu.ft (98%, 99%, 99.75%, 100% PrGs)	Fumigation of barns. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	1.5-3 lb/ 1,000 cu.ft [less than 100,000 cu.ft] or 1.25-1.5 lb/ 1,000 cu.ft [100,000-500,000 cu.ft] or 1-1.25 lb/ 1,000 cu.ft [500,000-1,000,000 cu.ft] (99.65%, 99.8%, 100% PrGs) or	Fumigation of barns. Expose for 24 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Barns (continued)		
		1 lb/1,000 cu.ft [over 1,000,000 cu.ft] (99.65%, 99.8%, 100% PrGs)	
/61012EA	Farm Storage Areas		
IMAAAFA	Stored product insects	3 lb/1,000 cu.ft (98% PrGs)	Fumigation of farm storage areas. Expose for 24 hours.
/61006EA	Greenhouses (Empty)		
INATANA	Khapra beetle	5 lb/1,000 cu.ft (98% PrGs)	Fumigation of empty greenhouses. Use in accordance with the plant quarantine program of the United States Department of Agriculture. Expose for 48 hours.
IRAWAAA ILAAABA IRAAABA	Mealybugs Mites Scales	3 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of empty greenhouses. Expose for 4 hours.
/61007EA	Mushroom Houses (Empty)		
IOAVABA IMAAAFA	Mushroom flies Stored product insects	2 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of empty mushroom houses. Expose for 24 hours.
VKGAAAA	Rodents	0.25 lb/1,000 cu.ft (100% PrGs)	Fumigation of empty mushroom houses. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/55000EA	Poultry Houses (Empty)		
IQAFACA	Bed bug	2 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of empty poultry houses. Expose for 24 hours.
ILAHABA	Poultry mite		

(Household)

General Warnings and Limitations: Fumigation of domestic dwellings is limited to professional pest control operators. Do not use formulations containing more than 2 percent chloropicrin for household sites.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/63007EA	Domestic Dwelling Contents (including Furniture)		
IQAFACA	Bed bug	1-3 lb/1,000 cu.ft (98%, 99%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of domestic dwelling contents. Apply by atmospheric fumigation. Expose for 24 hours.
ISASAFA	Carpenter ants		
INATAFA	Carpet beetle		
INABADA	Cigarette beetle		
ITBSABA	Clothes moth		
IVAAABA	Cockroaches		
INABAAA	Deathwatch beetle family		
INABAEA	Drugstore beetle	2-3 lb/1,000 cu.ft (98%, 99%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of domestic dwelling contents. Apply by vacuum chamber. Expose for 2 hours with a sustained vacuum of 25 to 27 inches (equivalent to a barometric pressure of 3 to 5 inches mercury).
INAAACA	Powderpost beetles		
IMPBACA	Silverfish		
IMGAAAA	Termites (including dampwood and drywood termites)		
/63000EA	Domestic Dwellings (including Garages)		
ISASAAA	Ants	1-3.75 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.75%, 100% PrGs)	Fumigation of domestic dwellings. Apply by structural fumigation. Apply the lower dosage for dwellings in good condition and the higher dosage for dwellings in unfavorable condition. Expose for 12 to 24 hours.
IQAFACA	Bed bug		
ISASAFA	Carpenter ants		
INATAFA	Carpet beetle		
ITBSABA	Clothes moth		
IVAAABA	Cockroaches		
INABAAA	Deathwatch beetle family		
INBEAFA	Lyctus beetles		
IJCAAAA	Millipedes		
INALANA	Oldhouse borer		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Domestic Dwellings (including Garages) (continued)		
	Pest list continued from previous page.		
INAAACA	Powderpost beetles		
IMPBACA	Silverfish		
IKAAAAA	Spiders		
IMGAAAA	Termites (including dampwood and drywood termites)		
VKGAAAA	Rodents (including mice and rats)	0.25-0.31 lb/ 1,000 cu.ft (98%, 99%, 99.75%, 100% PrGs)	Fumigation of domestic dwellings. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	1.5-3 lb/ 1,000 cu.ft [less than 100,000 cu.ft] or 1.25-1.5 lb/ 1,000 cu.ft [100,000-500,000 cu.ft] or 1-1.25 lb/ 1,000 cu.ft [500,000-1,000,000 cu.ft] or 1 lb/1,000 cu.ft [over 1,000,000 cu.ft] (99.65%, 99.8%, 100% PrGs)	Fumigation of domestic dwellings. Expose for 24 hours.

METHYL BROMIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Wood or Wood Structure Protection Treatment)		
/64001EA	Lumber and Wood Products		
IMAAAKA	Wood destroying insects	1-3 lb/1,000 cu.ft (98%, 99% 99.5%, 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of lumber and wood products. Apply by atmospheric fumigation. Expose for 24 hours.
		2-3 lb/1,000 cu.ft (98%, 99% 99.65%, 99.75%, 99.8%, 100% PrGs)	Fumigation of lumber and wood products. Apply by vacuum chamber. Expose for 2 hours with a sustained vacuum of 25 to 27 inches (equivalent to a barometric pressure of 3 to 5 inches mercury).
	(Commercial and Industrial Uses)		
/70005EA	Boxcars/Railway Cars (Empty)		
INAAAEA ITBMCHA	Branbugs Indianmeal moth	3.5-4.5 lb/ 1,000 cu.ft (100% PrGs)	Fumigation of empty boxcars/railway cars of wood composition. Expose for 16 to 24 hours. Allow 4 hours for aeration.
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (100% PrGs)	Fumigation of empty boxcars/railway cars. Expose for 12 to 18 hours.
INARAGA	Sawtoothed grain beetle	3-3.75 lb/ 1,000 cu.ft (100% PrGs)	Fumigation of empty boxcars/railway cars of steel composition. Expose for 16 to 24 hours. Allow 4 hours for aeration.
IMAAAFA	Stored product insects	2 lb/1,000 cu.ft [steel boxcar in good condition] (100% PrGs) or	Fumigation of empty boxcar/railway cars. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Boxcars/Railway Cars (Empty) (continued)		
		2.5 lb/1,000 cu.ft [steel boxcar in fair condition] or 2.5 lb/1,000 cu.ft [wood boxcar in good condition] or 3 lb/1,000 cu.ft [wood boxcar in fair condition] (100% PrGs) or 10-15 lb/boxcar (98%, 100% PrGs)	
/71000EA	Food Processing, Handling and Storage Areas		Specific sites under this general grouping include: bakeries, cereal plants, coffee warehouses, grain storage buildings, meat storage buildings, milling plants, packaging plants and port warehouses.
VKDAAAA VKCCAAA VKGAAAA	Bats Moles Rodents (including house mouse, Norway rat and roof rat)	0.25-0.31 lb/1,000 cu.ft (98%, 99%, 99.5%, 99.8% 100% PrGs)	Fumigation of food processing, handling and storage areas. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Food Processing, Handling and Storage Areas (continued)		
IMAAAFA	Stored product insects	1.5-3 lb/ 1,000 cu.ft [less than 100,000 cu.ft] or 1.25-1.5 lb/ 1,000 cu.ft [100,000-500,000 cu.ft] or 1-1.25 lb/ 1,000 cu.ft [500,000-1,000,000 cu.ft] or 1 lb/1,000 cu.ft [over 1,000,000 cu.ft] (98%, 99%, 99.5% 99.65%, 99.8%, 100% PrGs)	Fumigation of food processing handling and storage areas. Expose for 12 to 24 hours.
/71008EA	Meat Processing Plants (including Ham Houses)		
IOAZABA	Cheese skipper	1-2 lb/1,000 cu.ft (98%, 100% PrGs)	Fumigation of meat processing plants. Expose for 12 to 24 hours.
INATAKA	Larder beetle		
ILAAABA	Mites		
INAOADA	Redlegged ham beetle		
/70004EA	Ships (Cargo)/Steel Barges		
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (100% PrGs)	Fumigation of cargo ships and steel barges. Expose for 12 to 18 hours.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Ships (Cargo)/Steel Barges (continued)		
IMAAAFA	Stored product insects	1-2 lb/1,000 cu.ft (98%, 100% PrGs)	Fumigation of cargo ships and steel barges. Expose for 12 to 24 hours.
/70006EA	Trailers (Empty)		
/70003EA	Van Containers (Empty)		
VKGAAAA	Rodents (including house mouse, Norway rat and roof rat)	0.25 lb/1,000 cu.ft (100% PrGs)	Fumigation of empty trailers and van containers. Expose for 12 to 18 hours.
IMAAAFA	Stored product insects	1-3 lb/1,000 cu.ft (100% PrGs)	Fumigation of empty trailers and van containers. Apply the lower dosage for trailers and van containers in good condition and the higher dosage for trailers and van containers in fair condition. Expose for 12 to 24 hours.

Listing of Registered Pesticide Products by Formulation

&099.9901 100% technical chemical
methyl bromide (053201)
003377-00009 005785-00051 015298-00004*
*jacket currently unavailable for review

&067.0002 67% formulation intermediate
methyl bromide (053201)
005785-00052 005785-00056

&233.0018 33% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00025

&243.0018 43% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000550-00116#
#suspended

&245.0018 45% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00023 008536-00006 011220-00011

&250.0018 50% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000550-00128# 005785-00048 008536-00009 011220-00010
#suspended

&257.0018 57% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000550-00129# 005785-00028 008536-00007 011220-00004
#suspended

&266.0018 66% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
003377-00017 009782-00053 014775-00020

&267.0018 67% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000550-00117# 003442-00699 005549-00068 005785-00024
008536-00005 008622-00011 008622-00013 008853-00003
011220-00007
#suspended

&267.0018 67% (9.51 lb/gal) pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00045 037733-00006

Listing of Registered Pesticide Products by Formulation (continued)

&268.6018 68.6% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000876-00260 001598-00159 001598-00224 002124-00499
003442-00680 003743-00182 003743-00337 004185-00351
005549-00050 005797-00103 008622-00001 008622-00009
008622-00014 008853-00001 009859-00222 014775-00002
042463-00028

&268.6018 68.6% (8.23 lb/gal) pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00013

&270.0018 70% pressurized gas
methyl bromide (053201) plus chlorinated C3 hydrocarbons (029001 and 029002)
008536-00010

methyl bromide (053201) plus chloropicrin (081501)
005785-00019 005785-00026

&275.0018 75% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00040 008536-00001 008536-00011 008622-00015
011220-00006 011220-00008

&280.0018 80% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00047 011220-00003

&288.2018 88.2% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
014775-00008

&288.2018 88.2% (12 lb/gal) pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
005785-00061

&298.0018 98% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000264-00360 000481-00078 000550-00123# 000876-00256
003377-00007 003377-00016 003377-00018 005549-00073
005785-00004 005785-00022 005785-00042 006720-00230
008622-00006 008622-00010 008622-00012 008853-00002
009782-00056 009859-00227 014775-00019 019713-00088*
045115-00030
#suspended
*jacket currently unavailable for review

&298.0018 98% (14.11 lb/gal) pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
037733-00005

Listing of Registered Pesticide Products by Formulation (continued)

&299.0018 99% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000876-00258 005785-00007

&299.5018 99.5% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
000550-00131# 005785-00008 008536-00012* 011220-00009
#suspended
*jacket currently unavailable for review

&299.6518 99.65% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
008622-00017

&299.7518 99.75% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
003377-00016 005785-00055

&299.8018 99.8% pressurized gas
methyl bromide (053201) plus chloropicrin (081501)
008622-00016

&299.9918 100% pressurized gas
methyl bromide (053201)
000485-00048 000550-00130 000876-00257 003377-00008
003377-00015 005785-00011 005785-00041 008536-00015
008622-00005 036301-00006#
#suspended

&299.9918 100% (14.4 lb/gal) pressurized gas
methyl bromide (053201)
037733-00007

&299.9918 100% (14.5 lb/gal) pressurized gas
methyl bromide (053201)
005785-00021

9999999 State Label Registrations

AZ Reg. No.
005785-03682 005785-03683

CA Reg. No.
000550-04772 000550-04781 000550-07428 005481-03842
005481-03843 005481-03844 005481-03862 005785-03684
005785-03685 005785-03686 005785-03689 005785-03691
005785-03693 005785-03695 008536-05611 008536-05612
008536-05613 008536-05616 008536-06020 010965-10035
011019-09360 011101-08248 011174-08190 011198-03734
011220-05370 011220-05371 011220-05581 011220-05627
011220-05629 011220-05630 011220-05631 011220-05632
011231-03718 034485-06991

FL Reg. No.
000829-06760 000829-06761 000829-06762 003122-07560
003122-07561 003122-07562 003122-07563 003122-07564
003442-03254 005785-03681 009782-03631 015091-10542

HI Reg. No.
000550-07429 037843-08538 037843-08545 037843-08546
037843-08547 037843-08548 037843-08549 037843-08566

MI Reg. No.
005785-03680

NV Reg. No.
037855-08290

WA Reg. No.
005785-03675 005785-03676

GUIDE TO USE OF THIS BIBLIOGRAPHY

1. CONTENT OF BIBLIOGRAPHY. This bibliography contains citations of all studies considered relevant by EPA in arriving at the positions and conclusions stated elsewhere in the Standard. Primary sources for studies in this bibliography have been the body of data submitted to EPA and its predecessor agencies in support of past regulatory decisions. Selections from other sources including the published literature, in those instances where they have been considered, will be included.

2. UNITS OF ENTRY. The unit of entry in this bibliography is called a "study." In the case of published materials, this corresponds closely to an article. In the case of unpublished materials submitted to the Agency, the Agency has sought to identify documents at a level parallel to the published article from within the typically larger volumes in which they were submitted. The resulting "studies" generally have a distinct title (or at least a single subject), can stand alone for purposes of review, and can be described with a conventional bibliographic citation. The Agency has attempted also to unite basic documents and commentaries upon them, treating them as a single study.

3. IDENTIFICATION OF ENTRIES. The entries in this bibliography are sorted numerically by "Master Record Identifier," or MRID, number. This number is unique to the citation, and should be used at any time specific reference is required. It is not related to the six-digit "Accession Number" which has been used to identify volumes of submitted studies; see paragraph 4(d)(4) below for a further explanation. In a few cases, entries added to the bibliography late in the review may be preceded by a nine-character temporary identifier. These entries are listed after all MRID entries. This temporary identifier number is also to be used whenever specific reference is needed.

4. FORM OF ENTRY. In addition to the Master Record Identifier (MRID), each entry consists of a citation containing standard elements followed, in the case of material submitted to EPA, by a description of the earliest known submission. Bibliographic conventions used reflect the standards of the American National Standards Institute (ANSI), expanded to provide for certain special needs.

a. Author. Whenever the Agency could confidently identify one, the Agency has chosen to show a personal author. When no individual was identified, the Agency has shown an identifiable laboratory or testing facility as author. As a last resort, the Agency has shown the first submitter as author.

b. Document Date. When the date appears as four digits with no question marks, the Agency took it directly from the document. When a four-digit date is followed by a question mark, the bibliographer deduced the date from evidence in the document. When the date appears as (19??), the Agency was unable to determine or estimate the date of the document.

c. Title. In some cases, it has been necessary for Agency bibliographers to create or enhance a document title. Any such editorial insertions are contained between square brackets.

d. Trailing Parentheses. For studies submitted to the Agency in the past, the trailing parentheses include (in addition to any self-explanatory text) the following elements describing the earliest known submission:

    (1) Submission Date. The date of the earliest known submission appears immediately following the word "received."

    (2) Administrative Number. The next element, immediately following the word "under," is the registration number, experimental use permit number, petition number, or other administrative number associated with the earliest known submission.

    (3) Submitter. The third element is the submitter, following the phrase "submitted by." When authorship is defaulted to the submitter, this element is omitted.

    (4) Volume Identification (Accession Numbers). The final element in the trailing parentheses identifies the EPA accession number of the volume in which the original submission of the study appears. The six-digit accession number follows the symbol "CDL," standing for "Company Data Library." This accession number is in turn followed by an alphabetic suffix which shows the relative position of the study within the volume. For example, within accession number 123456, the first study would be 123456-A; the second, 123456-B; the 26th, 123456-Z; and the 27th, 123456-AA.

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting Registrations Under the Methyl Bromide Standard

MRID	CITATION
00012908	Dow Chemical Company (1962) Determination of Inorganic Bromide Residue in Pineapple Resulting from Soil Fumigations with Brozone, Trizone or Dowfume W-85. (Unpublished study received Jul 5, 1962 under 5F0426; CDL:090462-K)
00012999	Dow Chemical Company (1960) A Study of Bromide Residues in Strawberries from Preplant Soil Fumigation with Methyl bromide. (Unpublished study received Apr 28, 1961 under 464-223; CDL:119921-A)
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00043601	Getzendaner, M.E. (1961) Experimental fumigations with Methyl bromide. Cereal Science Today 6(8):268-270. (Also in unpublished submission received Nov 11, 1966 under 464-240; submitted by Dow Chemical U.S.A., Midland, Mich.; CDL:003480-H)
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00066267	Bistline, F.W. (1970) Letter sent to A.E. Willson dated Jul 27, 1970: Status report of tree response from methyl-bromide soil injections. (Unpublished study received Jan 11, 1972 under 464-104; prepared by Coca-Cola Co., submitted by Dow Chemical U.S.A., Midland, Mich.; CDL:003405-D)

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MRID CITATION

00077846 Stoner, H.C. (1970) Letter sent to Deryl Bondshu dated Dec 9, 1970: Results of analyses on sunflower seeds, treated and untreated with methyl bromide. (Unpublished study received Dec 19, 1972 under 3E1346; prepared by Stoner Laboratories, Inc., submitted by California, Dept. of Agriculture, Sacramento, Calif.; CDL:093603-B)

00079041 Abdalla, N.A.; Lear, B. (1975) Determination of inorganic bromide in soils and plant tissues with a bromide selective-ion electrode. Communications in Soil Science and Plant Analysis 6(5): 489-494. (Also in unpublished submission received Jul 21, 1981 under 1E2541; submitted by Interregional Research Project No. 4, New Brunswick, N.J.; CDL:070192-C)

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MRID	CITATION
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00096432	Interregional Research Project Number 4 (1980) Bromide Residues in Strawberries. Includes method Pr be-64 dated Dec 23, 1965 and method dated Oct 14, 1980. (Compilation; unpublished study, including published data, received Feb 26, 1982 under 2E2654; CDL:070705-A)
00102990	Sikov, M.; Cannon, W.; Carr, D.; et al. (1981) Teratologic Assessment of Butylene Oxide, Styrene Oxide and Methyl Bromide. Cincinnati, Ohio: U.S. National Institute for Occupational Safety and Health, Div. of Biomedical and Behavioral Science, Experimental Toxicology Branch. (Contract no. 210-78-0025; available from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; published study; CDL: 247562-B)

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00112926	Interregional Research Project No. 4 (1979) Analytical Methods Used and Recovery Data: Bromide. (Compilation; unpublished study received Aug 8, 1982 under 9E2139; CDL:071083-A)
00118768	Interregional Research Project No. 4 (1973) The Results of Tests on the Amount of Inorganic Bromide, Organic Bromide and Total Bromide Residues (Calculated as Br.) Remaining in or on Comb Honey Including a Description of the Analytical Methods Used. (Compilation; unpublished study received Apr 13, 1973 under 3E1387; CDL:093700-B)
00118817	Dow Chemical Co. (1955) Bromide Residues in Various Crops. (Compilation; unpublished study received on unknown date under PP0014; CDL:094562-A)
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OMB Approval No. 2000-0468

FIFRA SECTION 3(C)(2)(B) SUMMARY SHEET	EPA REGISTRATION NO.

PRODUCT NAME

APPLICANT'S NAME	DATE GUIDANCE DOCUMENT ISSUED

With respect to the requirement to submit "generic" data imposed by the FIFRA section 3(C)(2)(B) notice contained in the referenced Guidance Document, I am responding in the following manner:

☐ 1. I will submit data in a timely manner to satisfy the following requirements. If the test procedures I will use deviate from (or are not specified in) the Registration Guidelines or the Protocols contained in the Reports of Expert Groups to the Chemicals Group, OECD Chemicals Testing Programme, I enclose the protocols that I will use:

☐ 2. I have entered into an agreement with one or more other registrants under FIFRA section 3(C)(2)(B)(ii) to satisfy the following data requirements. The tests, and any required protocols, will be submitted to EPA by:

NAME OF OTHER REGISTRANT

☐ 3. I enclose a completed "Certification of Attempt to Enter Into an Agreement with Other Registrants for Development of Data" with respect to the following data requirements:

☐ 4. I request that you amend my registration by deleting the following uses (this option is not available to applicants for new products):

☐ 5. I request voluntary cancellation of the registration of this product. (This option is not available to applicants for new products.)

REGISTRANT'S AUTHORIZED REPRESENTATIVE	SIGNATURE	DATE

EPA Form 8580-1 (10-82)

OMB Approval No. 2000-0468

CERTIFICATION OF ATTEMPT TO ENTER INTO AN AGREEMENT WITH OTHER REGISTRANTS FOR DEVELOPMENT OF DATA

(To qualify, certify ALL four items)

1. I am duly authorized to represent the following firm(s) who are subject to the requirements of a Notice under FIFRA Section 3(c)(2)(B) contained in a Guidance Document to submit data concerning the active ingredient:	GUIDANCE DOCUMENT DATE ACTIVE INGREDIENT

NAME OF FIRM	EPA COMPANY NUMBER

(This firm or group of firms is referred to below as "my firm".)

2. My firm is willing to develop and submit the data as required by that Notice, if necessary. However, my firm would prefer to enter into an agreement with one or more other registrants to develop jointly, or to share in the cost of developing, the following required items or data:

3. **My firm has offered in writing to enter into such an agreement. Copies of the offers are attached. That offer was irrevocable and included an offer to be bound by an arbitration decision under FIFRA Section 3(c)(2)(B)(iii) if final agreement on all terms could not be reached otherwise. This offer was made to the following firm(s) on the following date(s):**

NAME OF FIRM	DATE OF OFFER

However, none of those firm(s) accepted my offer.

4. **My firm requests that EPA not suspend the registration(s) of my firm's product(s), if any of the firms named in paragraph (3) above have agreed to submit the data listed in paragraph (2) above in accordance with the Notice. I understand EPA will promptly inform me whether my firm must submit data to avoid suspension of its registration(s) under FIFRA Section 3(c)(2)(B). (This statement does not apply to applicants for new products.) I give EPA permission to disclose this statement upon request.**

TYPED NAME	SIGNATURE	DATE

EPA Form 8580-6 (10-82)

PRODUCT SPECIFIC DATA REPORT

EPA Reg. No.________________________ Date ________________________________

Guidance Document for ____

Registration Guideline No.	Name of Test	Test not required for my product listed above (check below)	I am complying with data requirements by Citing MRID Number or EPA Accession Number	Submitting Data (Attached)	(For EPA Use Only) Accession Numbers Assigned
§158.120 PRODUCT CHEMISTRY					
61-1	Identity of ingredients				
61-2	Statement of composition				
61-3	Discussion of formation of ingredients				
62-1	Preliminary analysis				
62-2	Certification of limits				
62-3	Analytical methods for enforcement limits				
63-2	Color				
63-3	Physical state				
63-4	Odor				
63-5	Melting point				
63-6	Boiling point				
63-7	Density, bulk-density, or specific gravity				
63-8	Solubility				
63-9	Vapor pressure				
63-10	Dissociation constant				
63-11	Octanol/water partition coefficient				
63-12	pH				

Registration Guideline No.	Name of Test	Test not required for my product listed above (check below)	I am complying with data requirements by Citing MRID Number or EPA Accession Number	 Submitting Data (Attached)	(For EPA Use Only) Accession Numbers Assigned
63-13	Stability				
63-14	Oxidizing/reducing reaction				
63-15	Flammability				
63-16	Explodability				
63-17	Storage stability				
63-18	Viscosity				
63-19	Miscibility				
63-20	Corrosion characteristics				
63-21	Dielectric breakdown voltage				
§158.135 TOXICOLOGY					
81-1	Acute oral toxicity, rat				
81-2	Acute dermal toxicity, rabbit				
81-3	Acute inhalation, toxicity, rat				
81-4	Primary eye irritation, rabbit				
81-5	Primary dermal irritation				
81-6	Dermal sensitization				

FORMULATOR'S EXEMPTION STATEMENT
(40 CFR 152.85)

EPA File Symbol/Reg. No. ______________ Product Name ____________________

Applicant's Name and Address ____

____

____

____

As an authorized representative of the applicant for registration of the product identified above, I hereby certify that:

(1) This product contains the active ingredient(s): ________________

____

____

(2) Each active ingredient listed in paragraph (1) is present solely as the result of the incorporation into the product (during formulation or packaging) of another product which contains that active ingredient, which is registered under FIFRA sec. 3, and which is purchased by us from another producer.

(3) Indicate by circling (A) or (B) below which paragraph applies:

(A) An accurate Confidential Statement of Formula (EPA Form 8570-4) for the above identified product is attached to this statement. That formula statement indicates, by company name, registration number and product name, the source of the active ingredient(s) listed in paragraph (1).

OR

(B) The Confidential Statement of Formula dated _________ on file with the EPA is complete, current and accurate and contains the information required on the current CSF Form No. 8570-4. The registered source(s) of the active ingredient(s) listed in paragraph (1) is/are listed below:

Active ingredient	Source: Product name and Reg. No.

Signature ______________________________

Date ______________ Title ______________________________